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**IMPLEMENTING RULES AND REGULATIONS (IRR) OF REPUBLIC ACT NO. 9514
OTHERWISE KNOWN AS THE "FIRE CODE OF THE PHILIPPINES OF 2008"**

Pursuant to the provision of Section 14 in relation to Section 5 of Republic Act No. 9514, entitled "AN ACT ESTABLISHING A COMPREHENSIVE FIRE CODE OF THE PHILIPPINES, REPEALING PRESIDENTIAL DECREE NO. 1185, AND FOR OTHER PURPOSES", the following Rules and Regulations are hereby adopted in order to carry out the provisions of this Code.

RULE 1. INTERPRETATION

This IRR shall be interpreted in the light of the Declaration of Policy found in Section 2 of the Code:

"It is the policy of the State to ensure public safety, promote economic development through the prevention and suppression of all kinds, of destructive fires, and promote the professionalization of the fire service as a profession. Towards this end, the State shall enforce all laws, rules and regulations to ensure adherence to standard fire prevention and safety measures, and promote accountability in the fire protection and prevention service."

RULE 2. COVERAGE

This IRR shall cover the following:

- A. All persons;
- B. All private or public buildings, facilities or structures and their premises erected or constructed before and after the effectivity hereof;
- C. Design and installation of mechanical, electronics and electrical systems relative to fire protection;
- D. Manufacturing, storage, handling and/or use, and transportation of explosives and/or combustible, flammable liquids and gases, toxic and other hazardous materials and operations, and their wastes;
- E. Fire safety planning, design, construction, repair, maintenance, rehabilitation and demolition;
- F. Fire protective and warning equipment or systems;

- G. All land transportation vehicles and equipment, ships or vessels docked at piers or wharves or anchored in seaports; and
- H. Petroleum industry installations.

RULE 3. DEFINITION OF TERMS

For purposes of this IRR, the following terms, or words or phrases shall mean or be understood as follows:

Abatement. Any act that would remove or neutralize a fire hazard.

Building Administrator. Any person who acts as agent of the owner and manages the use of a building for the latter.

Aerodrome. An airport, a defined area on land or water (including any building, installation and equipment) intended to be used wholly or in part for the arrival, departure and surface movement of aircrafts.

Air Carrier or Operator. A person who undertakes, whether directly or indirectly, by lease or any other arrangements, to engage in air transportation services or air commerce.

Aircraft Engine. Any engine used, or intended to be used, for the propulsion of an aircraft and includes all parts, appurtenances, and accessories thereof other than propellers.

Aircraft Operation Area (AOA). Any area used or intended for use for the parking, taxiing, takeoff, landing or other ground-based aircraft activity.

Aircraft. Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

Aircrafts Service Station. That portion of an airport where flammable liquids are stored or dispensed and shall include all facilities essential thereto, such as but not limited to, underground tanks from which aircraft fuel and lubricants may be drawn through dispensing devices.

Airport. Any area of land or water designed, equipped, set apart or commonly used for affording facilities for the landing and departure of aircraft and includes any area or space, whether on the ground, on the roof of a building or elsewhere, which is designed, equipped or set apart for affording facilities for the landing and departure of aircrafts capable of descending or climbing vertically.

Anesthetics Gas. A medical gas used as anesthetic agents for surgical procedures that could either be flammable or non-flammable. Examples of flammable anesthetics are cyclopropane and ethylene. Examples of non-flammable anesthetic gases are nitrous oxides and halothane.

Approved. Acceptable to the authority having jurisdiction.

Arena stage. A stage or platform that opens on at least three (3) sides to audience seating. It may be with or without overhead scene handling facilities.

Authorized Government Depository Bank (AGDB) or Authorized Government Servicing Bank (AGSB). Government servicing banks such as Land Bank of the Philippines (LBP), Development Bank of the Philippines (DBP), United Coconut Planters Bank (UCPB), and Philippine Veterans Bank (PVB), wherein fire code revenues are deposited for subsequent remittance to the Bureau of Treasury (BOT).

Automatic Fire Suppression System. An integrated system of underground or overhead piping or both connected to a source of extinguishing agent or medium and designed in accordance with fire protection engineering standards which, when actuated by its automatic detecting device, suppresses fires within the area protected.

Automotive Service Station. That portion of property where liquids used as motor fuels are stored and dispensed from fixed equipment into the fuel tanks of motor vehicles and shall include any facilities available for the sale and service of tires, batteries and accessories, and for minor automotive maintenance work.

Baffle. A non liquid-tight transverse partition in a cargo tank.

Bale. A large bundle or package of hay or a raw material such as cotton, tightly bound with string or wire to keep it in shape during transportation or storage.

Below Ground Container. A storage installation in which the maximum liquid level in the container below the surrounding grade or below a backfill berm, which is at least two hundred fifty centimeters (250 cm) wide at the top, and then slopes away from the container at natural angle of repose or is retained two hundred fifty centimeters (250 cm) from the container by a retaining wall, and constructed of earth, concrete, solid masonry or other suitable material designed to prevent the escape of liquid.

Berm. In open-pit mining, a berm refers to rocks piled alongside a haulage road or along the edge of a dump point intended as a safety measure. They are commonly required by government organizations to be at least one-half as tall as the wheel of the largest mining machine on-site.

Blasting Agent. Any material or mixture consisting of a fuel and oxidizer used to set off explosives.

Blowout. A sudden release of oil and gas from a well.

Boiling point. The temperature at which the vapor pressure of a liquid equals the surrounding atmospheric pressure. Where an accurate boiling point is unavailable for the material in question, or for mixture which do not have a constant boiling point, for purposes of this classification the ten percent (10%) point of distillation performed in accordance with the Standard Method of Test for Distillation of Petroleum Products ASTM D-86-62, may be used as the boiling point of the liquid.

Boil-over. The expulsion of crude oil (or certain other liquids) from a burning tank in which the light fractions of the crude oil burn off producing a heat wave in the residue, which on reaching a water strata may result in the explosion of the portion of the contents of the tank in the form of a froth.

Brine. Any liquid cooled by the refrigerant and used for the transmission of heat without a change in its state, having no flash point or a flash point above sixty five and six-tenths Celsius (65.6°C) as determined by the American Society of Testing Materials Method D93.

Brush. Land covered with a dense undergrowth of small trees and brushes.

Bulk Oxygen System. An assembly of equipment, such as oxygen storage containers, pressure regulators, safety devices, vaporizers, manifolds, and interconnecting piping, that has a storage capacity of more than five hundred sixty six cubic meters (566 m³) of oxygen including unconnected reserves on hand at the site.

Bulk Plant. That portion of a property where liquids are received by tank vessel, pipelines, tank cars, or tank vehicle, and are stored or blended in bulk for the purpose of distributing such liquids by tank vessels, pipeline, tank car, tank vehicle, portable tank or container.

Bulkhead. A liquid-tight closure between compartments of a cargo tank.

Cargo Tank. Any tank having a liquid capacity more than four hundred fifty liters (450l) used for carrying flammable and combustible liquids and mounted permanently or otherwise upon a tank vehicle. The term "cargo tank" does not apply to any container used solely for the purpose of supplying fuel for the propulsion of the tank vehicle upon which it is mounted.

Cellulose Nitrate or Nitro Cellulose. A highly combustible and explosive compound produced by the reaction of nitric acid with a cellulose material.

Cellulose Nitrate Plastic (Pyroxylin). Any plastic substance, materials or compound having cellulose nitrate (nitro cellulose) as base.

City/Municipal Fire Marshal. The duly designated head of the City or Municipal Fire Station including those designated as "Officer-in-Charge" or in an "Acting" capacity. This shall also apply to highly urbanized Cities and Stations where by its approved organization the head is the District Fire Marshal or Station Commander as the case maybe.

Chemical Plant. A large integrated plant or that portion of such plant other than a refinery or distillery where flammable or combustible liquids are produced by chemical reactions or used in chemical reactions.

Class A Fires. Fires involving ordinary combustible materials such as wood, cloth, rubber and plastics.

Class B Fires. Fires involving flammable liquids and gases.

Class C Fires. Fires involving energized electrical equipment.

Class D Fire. Fires involving combustible materials, such as sodium, magnesium, potassium, and other similar materials.

Class K Fires. Fires in cooking appliances that involve combustible cooking media (vegetable or animal oils and fats).

Closed Container. Any container so sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures.

Collecting Officer. An accountable officer, who shall be responsible in the collection, deposit and remittance of fire code revenues from all fire code taxes, fees/charges and fines with AGDB or AGSB.

Combination Standpipe. A pipeline system filled with water and connected to a constant water supply for the use of the BFP and the occupants of the buildings solely for fire suppression purposes.

Combustible Fiber Loose House. An enclosed and isolated structure where loose fibers are worked upon, and used as storage for such fibers.

Combustible Fibers. Any readily ignitable and free-burning fibers, such as but not limited, to cocoa fiber, cotton, excelsior, hay, hemp, henequen, istle, jute, kapok, oakrum, rags, sisal, Spanish moss, straw, tow, waste cloth, waste paper, certain synthetic fibers commonly used in commerce, or any material in a fibrous or shredded form that will readily ignite when heat sources are present.

Combustible Liquid. Any liquid having a flash point at or above thirty seven and eight tenths degrees Celsius (37.8°C), and classified as follows:

Class II Liquid. Any liquid that has a flash point at or above thirty seven and eight tenths degrees Celsius (37.8°C) and below sixty degrees Celsius (60°C).

Class IIIA Liquid. Any liquid that has a flash point at or above sixty degrees Celsius (60°C), but below ninety three degrees Celsius (93°C).

Class IIIB Liquid. Any liquid that has a flash point at or above ninety three degrees Celsius (93°C).

Combustible Waste. Also known as loose waste material, are those generated by an establishment or process and, being salvageable, are retained for scrap or reprocessing on the premises where generated. These include, but not limited to, all combustible fibers, hay, straw, hair, feathers, down, wood shavings, turnings, styropor, all types of plastics, all types of paper products, soiled cloth trimmings and cuttings, rubber trimmings and buffings, metal fines, used oil and any mixture of the above items, or any other salvageable combustible waste material.

Community/Barangay Fire Brigade. A group of firefighters performing fire suppression activities within a specified jurisdiction.

Compressed Gas. One that exists solely in the gaseous state under pressure in the range of two hundred seventy three kilopascal (273 KPa) to twenty four thousand nine hundred twenty three kilopascal (24,923 KPa) at all normal atmospheric temperature ranging from twenty degrees Celsius (20°C) to thirty seven and eight tenths degrees Celsius (37.8°C) inside its container.

Compressed Gas Container. A pressure container designed to hold compressed gases at pressures greater than one atmosphere at twenty degrees Celsius (20°C).

Compressed Gas Mixture. A mixture of two or more compressed gases contained in a single packaging, the hazard properties of which are represented by the properties of the mixture as a whole.

Compressed Gas System. An assembly of components, such as containers, reactors, pumps, compressors and connecting piping and tubing, designed to contain, distribute or transport compressed gases.

Container. Any vessel of less than two hundred twenty seven liters (227l) capacity used for transporting or storing liquids.

Corrosive Liquid. Any liquid which causes fire when in contact with organic matter or with certain chemicals.

Crude Oil. Any naturally-occurring, unrefined petroleum liquid.

Cryogenic. Is descriptive of any material which, by its nature or as a result of its reaction with other elements, produces a rapid drop in temperature of the immediate surroundings.

Cryogenic Container. A pressure or low-pressure or atmospheric container of any size designed or used for the transportation, handling or storage of a cryogenic fluid, and which utilizes venting, insulation, refrigeration or a combination thereof to maintain the pressure within the design parameters for such container and to keep the contents in a liquid state.

Cryogenic Fluids. Fluids produced or stored at very low temperatures and that have normal boiling point below negative fifty five degrees Celsius (-55°C).

Cryogenic Inground Container. A container in which the maximum liquid level is below the normal surrounding grade and is constructed of natural materials, such as earth and rock and pendent upon the freezing of water-saturated earth materials for its tightness or impervious nature.

Curtain Board. A vertical panel of non-combustible or fire resistive materials attached to and extending below the bottom chord of the roof trusses to divide the underside of the roof into separate compartments so that heat and smoke will be directed upwards to a roof vent.

Customer Relations Officer (CRO). is an organic member of the Bureau of Fire Protection who is tasked to attend to the immediate needs and concerns of the customer, applicants or any taxpayer transacting business in a unit/station/office.

Damper. A normally open device installed inside air duct systems which automatically closes to restrict the passage of smoke or fire.

Derrick. A framework that is constructed over a mine or oil well for the purpose of boring or lowering pipes.

Detearing. A process for rapidly removing excess wet coating material from a dipped or coated object or material by passing it through an electrostatic field.

Dip Tank. A tank, vat or container of flammable or combustible liquid in which articles or materials are immersed for purposes of coating, finishing, treating, or similar processes.

Dispensing Device. Equipment used to deliver petroleum products such as gasoline, diesel and kerosene: installed in a fore court/curve area within the retail outlet. Dispensing device can either be a self-contained or with a remote/submersible pump.

Distillation. The process of first raising the temperature to separate the more volatile from the less volatile parts and then cooling and condensing the resulting vapor so as to produce a nearly purified substance.

Distillery. A plant or that portion where liquids produced by fermentation and distillation are concentrated, and where the concentrated products may also be mixed, stored, or packaged.

Drum. A container which has a total capacity of two hundred twenty seven liters (227l) used in storing liquid.

Dry Standpipe. A type of standpipe system in which the pipes are normally not filled with water. Water is introduced into the system thru fire service connections when needed.

Duct System. A continuous passageway for the transmission of air.

Dust. Any finely divided solid, four millimeters (4 mm) or less in diameter (that is, material capable of passing through a U.S. No. 40 standard sieve) which, if mixed with air in the proper proportion, becomes explosive and may be ignited by a flame or spark or other source of ignition.

Electrical Arc. An extremely hot luminous bridge formed by the passage of an electric current across a space between two conductors or terminals.

Electrostatic Fluidized Bed. A container holding powder coating material that is aerated from below so as to form an air-supported expanded cloud of such material that is electrically charged with a charge opposite to that of the object to be coated. Such object is transported through a container immediately above the charged and aerated materials in order to be coated.

Ember. A hot piece or lump that remains after a material has partially burned, and is still oxidizing without the manifestation of flames.

Enclosed Platform. A partially enclosed portion of an assembly room the ceiling of which is not more than one hundred fifty five centimeters (155 cm) above the proscenium opening that is designed or used for the presentation of plays, demonstrations, or other entertainment wherein scenery, drops, decorations or other effects may be installed or used.

Explosive Magazines. Buildings, structures, or facilities used for the storage of explosive, shells, projectiles and ammunitions.

Explosive. Includes any chemical compound or mechanical mixture that is commonly used or intended for the purpose of producing an explosion.

Finishes. Materials used as final coating of a surface for ornamental or protective purposes.

Fire Alarm. Any visual or audible signal produced by a device or system to warn the occupants of the building or fire fighting elements of the presence or danger of fire.

Fire Alerting System. A fire alarm system activated by the presence of fire, where the signal is transmitted to designated locations instead of sounding a general alarm.

Fire Brigade. A collective term that is used to refer to a group of firefighters, primarily performing fire suppression activities in areas such as, but not limited to, community/barangay, company, and other government and non-government establishments.

Fire Code Fees/Charges. Charges for regulation, inspection and other fire service activities in the enforcement of the Fire Code and its IRR.

Fire Code Fines. Amount imposed for violators of the Fire Code and its IRR.

Fire Code Revenues or Revenues. Collective income derived from the collection of fire code taxes, fees/charges and fines.

Fire Code Taxes. Taxes prescribed in Section 12, b.2 to b.6 of the Fire Code.

Fire Door. A fire resistive door prescribed for openings in fire separation walls or partitions.

Fire Exit Drill. A practice drill for the orderly and safe evacuation of occupants in the buildings.

Fire Hazard. Any condition or act which increases or may cause an increase in the probability of the occurrence of fire, or which may obstruct, delay, hinder or interfere with fire fighting operations and the safeguarding of life and property.

Fire Lane. The portion of a roadway or public way that should be kept opened and unobstructed at all times for the expedient conduct of fire fighting operations.

Fire Protective and Fire Safety Device. Any device intended for the protection of buildings or persons to include, but not limited to, built-in protection system such as sprinklers and other automatic extinguishing system, detectors for heat, smoke and combustion products and other warning system components, personal protective equipment such as fire blankets, helmets, fire suits, gloves and other garments that may be put on or worn by persons to protect themselves during fire.

Fire Protective Assembly. An assembly incorporated in the structure designed to prevent the spread of fire, such as dampers, curtain boards, fire stoppers and the like.

Fire Resistance Rating. The time duration that a material or construction can withstand the effect of a standard fire test.

Fire Safety Constructions. Refers to the design and installation of walls, barriers, doors, windows, vents, means of egress and other elements integral to and incorporated into a building or structure in order to minimize danger to life from fire, smoke, fumes or panic before the building is evacuated. These features are also designed to achieve, among others, safe and rapid evacuation of people and properties through means of egress on construction which are sealed from smoke or fire, the confinement of fire or smoke in the room or floor of origin and delay their spread to other parts of the building by means of smoke sealed and fire resistant doors, walls and floors. It shall also mean to include the treatment of building components or contents with flame retardant chemicals.

Fire Trap. A building unsafe in case of fire because it will burn easily or because it lacks adequate exits or fire escapes.

Fire Volunteer Organization (FVO). An organized group of private firefighters recognized by the BFP, who have voluntarily formed themselves to perform fire-related activities.

Fire Volunteer. A person who voluntarily enters into firefighting service through a Fire Volunteer Organization (FVO) and undergoes the same discipline as that of BFP firefighters.

Fire Wall. A wall designed to prevent the spread of fire, having a fire resistance rating of not less than four (4) hours with sufficient structural stability to remain standing even if construction on either side collapses under fire conditions.

Fire. The active principle of burning, characterized by the heat and light of combustion.

Flame Retardant. Any compound or mixture which when applied properly improves the resistivity or fire resistance quality of fabrics and other materials.

Flame Spread Rating. The time in which flame will spread over the surface of a burning material.

Flammability. The characteristic of a material on how easily it will burn or ignite, causing fire or combustion.

Flammable Cryogenic Fluids. Are cryogenic fluids which are flammable in their vapor state.

Flammable Finishes. Are material coatings in which the material being applied is a flammable liquid, combustible liquid, combustible powder or flammable or combustible gel coating.

Flammable Liquids. Are liquids having flash points below thirty seven and eight tenths degrees Celsius (37.8°C) except any mixture having components

with flash points of seven and eight tenths degrees Celsius (37.8°C) or higher, the total of which make up ninety nine percent (99%) or more of the total volume of the mixture. Flammable liquids are classified as follows:

Class I-A Liquids include those liquids having flash points below twenty two and eight tenths degrees Celsius (22.8°C), and having a boiling point below thirty seven and eight tenths degrees Celsius (37.8°C).

Class I-B Liquids include those liquids having flash points below twenty two and eight tenths degrees Celsius (22.8°C), and having a boiling point at or above thirty seven and eight tenths degrees Celsius (37.8°C).

Class I-C Liquids include those liquids having flash points at or above twenty two and eight tenths degrees Celsius (22.8°C), and below thirty seven and eight tenths degrees Celsius (37.8°C).

Flammable Vapor Area. An area in which the concentration of flammable constituents (vapor, gas, fume, mist or dust) in air exceeds twenty five percent (25%) of their lower flammable limit (LFL) because of the flammable finish processes operation. It shall include: (1) the interior of spray booths; (2) the interior of ducts exhausting from spraying processes; (3) any area in the direct path or any area containing dangerous quantities of air-suspended powder, combustible residue, dust, deposits, vapor or mists as a result of spraying operations; and (4) the area in the vicinity of dip tanks, drain boards or associated drying, conveying or other equipment during operation or shutdown periods.

Flash Point of a Liquid. The lowest temperature a liquid at which sufficient vapor is given off to form an ignitable mixture with air, near the surface of the liquid or within the vessel used, as determined by appropriate laboratory test, as follows:

The flash point of liquids having a flash point at or below seventy nine degrees Celsius (79°C), except for fuel oils and certain viscous materials shall be determined in accordance with the Standard Method of Test for Flash Point by the Tag Closed Tester, ASTM D 56-61.

The flash point of liquids having a flash point above seventy nine degrees Celsius (79°C), except for fuel oils, shall be determined in accordance with the Standard Method of Test for Flash Point by the Cleveland open Cup Tester, ASTM D 92-57.

The flash point of fuel oil, and certain viscous materials having a flash point at or below seventy nine degrees Celsius (79°C), shall be determined in accordance with the Standard Method of Test for Flash Point by the Pensky-Martens Closed Tester, ASTM D 93-62.

Fogging. The creation of a cloud of ultra-fine droplets, which are airborne and readily picked up by the insect as it flies through the swathe of insecticide, fog or mist.

Forging. A process where a piece of metal is heated prior to changing its shape or dimensions.

Fluidized Bed. A container holding powder coating material that is aerated from below so as to form an air-supported expanded cloud of such material through which the preheated object to be coated is immersed and transported.

Fulminate. A kind of stable explosive compound which explodes by percussion.

Fumigant. Any substance which, by itself or in combination with any other substance, emits or liberates a gas, fume or vapor used for the destruction or control of insects, fungi, vermin, germs, rats, or other pests, and shall be distinguished from insecticides and disinfectants which are essentially effective in the solid or liquid phases. Examples are methyl bromide, ethylene dibromide, hydrogen cyanide, carbon disulphide and sulfuryl fluoride.

Fumigation. The utilization within an enclosed space of a fumigant in concentrations that is hazardous or acutely toxic to humans.

Fumigators. Persons or establishments engaged in fumigation and thermal insecticidal fogging.

Government Fire Brigade. A group of firefighters rendering firefighting activities in the premises of a public office.

Hangar. A large building in which aircrafts are kept or repaired.

Hazard Evaluation. Identification of potential hazards which includes risk evaluation that takes into account the likelihood of the hazard resulting in a fire or explosion.

Hazardous Fire Area. Any area covered with dry grass, cogon, reeds, brush, and other highly combustible growth or any area used for stockpiling of used or waste materials that, by virtue of exposure to environment, may cause its deterioration, decomposition or other conditions that fires are likely to occur therein and hard to suppress.

Hazardous Operation/Process. Any act of manufacturing, fabrication, conversion, or other similar operations that use or produce materials which are likely to cause fires or explosions.

Heavy Casting. Castings greater than eleven and three tenths kilograms (11.3 kg) with walls of large cross-sectional weights six and four tenths millimeters

(6.4 mm). Castings less than eleven and three tenths kilograms (11.3 kg) are considered light.

Heliport. An area of land or water or a structural surface that is used, or intended for use, for the landing and taking off of helicopters, and any appurtenant areas which are used, or intended for use, for heliport buildings and other heliport facilities.

Helistop. Same as "heliport," except that fueling, defueling, maintenance, repairs or storage of helicopters is not permitted.

High Piled Storage. Include combustible materials on pallets or in racks more than four meters (4 m) high. For highly combustible materials such as rubber goods and certain plastics, the critical height of piling may be as low as two hundred forty centimeters (240 cm). Buildings shall be deemed to be used for the storage of high piled combustible stock when the floor area used for such purpose exceeds either one-tenths (0.10) of the total floor area, or at least two hundred thirty two square meters (232 m²).

High Rise Buildings. Buildings, structures or facilities fifteen (15) meters or more in height.

Horizontal Channel. Any uninterrupted space between horizontal layers of stored commodities. Such channels may be formed by pallets, shelves, racks or other storage arrangements.

Horizontal Exit. A passageway from one building to another, or through or around a wall in approximately the same floor level.

Hose Box. A box or cabinet where fire hoses, valves and other equipment are stored and arranged for fire fighting.

Hose Reel. A cylindrical device turning on an axis around which a fire hose is wound and connected.

Hypergolic Fuel. A rocket or liquid propellant which consists of combinations of fuels and oxidizers which ignite spontaneously on contact with each other.

Impact Barriers. Are structures installed for the protection of dispensing devices against possible collision damage/s.

Industrial Baking and Drying. Is the industrial process of subjecting materials to heat for the purpose of removing solvents or moisture from the same, and/or to fuse certain chemical salts to form a uniform glazing on the surface of materials being treated.

Jumper. Any piece of metal or an electrical conductor used to bypass a safety device in an electrical system.

Limited Spraying Space. An area in which operations for touch-up or spot painting of a surface area not exceeding of one square meter (1 m^2) or less are conducted.

Liquefied Petroleum Gas (LPG). Any flammable gas liquefied through pressure. The liquid vaporizes under normal atmospheric pressure.

Loose Fibers. Fibers that are not bundled or packaged in suitable bales.

Loose House. A separate detached building in which unbaled combustible fibers are stored.

Machinery Room. A specific room which is permanently installed and used for the operation of machineries. Closets solely contained within and opening only into a room shall be considered a part of such room.

Magnesium. A highly flammable metal which burns to over two thousand nine hundred eighty degree Celsius ($2,980\text{ }^\circ\text{C}$). It is used as a principal element of aluminum alloy for the manufacture of mobile phones, laptop computers, cameras, and other electronic components, beverage cans, flashlight photography, flares, pyrotechnics, fireworks sparklers, automotive and truck components.

Material Safety Data Sheet (MSDS). Is a form that contains data and information regarding the properties of a particular substance.

Maximum Allowable Working Pressure (MAWP). Is the maximum pressure permissible at the top of a container in its operating position for a designated temperature, as established by the container manufacturer.

Means of Egress. Is a continuous and unobstructed route of exit from one point in a building, structure or facility to a public way.

Medical Air. A type of air product produced through the blending of compressed nitrogen and oxygen and used in variety of patients' application. It is also used during anesthesia as a substitute for nitrous oxide to reduce the high concentration of oxygen exposure.

Medical Gas. A type of gas used in medical and similar facilities, including oxygen, nitrous oxide, nitrogen, carbon dioxide, helium, medical air and mixtures of these gases.

Nesting. A method of securing flat-bottomed compressed gas containers upright in a tight mass using a contiguous three-point contact system whereby all containers within a group have a minimum of three points of contact with other containers, walls or bracing.

Occupancy. The purpose for which a building or portion thereof is used or intended to be used.

Occupant Load. The maximum number of persons that may be allowed to occupy a particular building, structure, or facility, or portions hereof.

Occupant. Any person actually occupying and using a building or portions thereof by virtue of a lease contract with the owner or administrator or by permission or sufferance of the latter.

Oil Burning Equipment. An oil burner of any type together with its tank, piping, wiring controls, blower, and related devices, and shall include all oil-fired units, heating and cooking appliances.

Organic Coating. A liquid mixture of binders such as alkyd, nitrocellulose, acrylic, or oil, and flammable and combustible solvents such as hydrocarbon, ester, ketene or alcohol, which when spread on a surface becomes a durable protective and decorative finish.

Organic Peroxide. A strong oxidizing organic compound which releases oxygen readily. It causes fire when in contact with combustible materials especially under conditions of high temperature.

Overloading. The use of one or more electrical appliances or devices which draw or consume electrical current beyond the designed capacity of the existing electrical system.

Owner. The person who holds the legal right of possession or title to a building or real property.

Oxidizing Material. A material that readily yields oxygen in quantities sufficient to stimulate or support combustion.

Ozone Depleting Refrigerant/Substance. Any group of halogenated hydrocarbon chemicals which photochemically reacts in the stratosphere in a way which destroys the ozone layer.

Panic Hardware. A mechanical device consisting of linkages and horizontal bars across a door, which when pushed from the inside will cause the door to open and facilitates exit from the building, structure or facility.

Picking Rooms. Rooms where baled, bundled or piled materials are segregated into desired sizes or groups.

Plastics.

Group A Plastics. Plastic materials having heat of combustion much higher than that of ordinary combustibles and burning rate higher than that of Group B plastics. Examples of Group A plastics include, but are not limited to, the following:

- ABS (acrylonitrile-butadiene-styrene copolymer)

- Acetal (polyformaldehyde)
- Acrylic (polymethyl methacrylate)
- Butyl rubber
- EPDM (ethylene propylene rubber)
- FRP (fiberglass-reinforced polyester)
- Natural rubber (expanded)
- Nitrile rubber (acrylonitrile butadiene rubber)
- PET or PETE (polyethylene terephthalate)
- Polybutadiene
- Polycarbonate
- Polyester elastomer
- Polyethylene
- Polypropylene
- Polystyrene (expanded and unexpanded)
- Polyurethane (expanded and unexpanded)
- PVC (polyvinyl chloride greater than fifteen (15%) percent plasticized, e.g., coated fabric unsupported film)
- SAN (styrene acrylonitrile)
- SBR (styrene butadiene rubber)

Group B Plastics. Plastic materials having heat of combustion and burning rate higher than that of ordinary combustibles, but not as high as those of Group A plastics. Examples of Group B plastics include, but are not limited to, the following:

- Cellulosics (cellulose acetate, cellulose acetate butyrate, ethyl cellulose)
- Chloroprene rubber
- Fluoroplastics (ECTFE, ethylene-chlorotrifluoroethylene copolymer; ETFE, ethylene-tetrafluoroethylene copolymer; FEP, fluorinated ethylene-propylene copolymer)
- Natural rubber (nonexpanded)
- Nylon (nylon 6, nylon 6/6)
- PVC (polyvinyl chloride greater than 5-percent, but not exceeding fifteen (15)-percent plasticized)
- Silicone rubber

Group C Plastics. Plastic materials having heat of combustion and burning rate similar to those of ordinary combustibles. Examples of Group C plastics include, but are not limited to, the following:

- Fluoroplastics (PCTFE, Polychlorotrifluoroethylene; PTFE, polytetrafluoroethylene)
- Melamine (melamine formaldehyde)
- Phenol
- PVC (polyvinyl chloride, rigid or plasticized less than five percent (5%), e.g., pipe, pipe fittings)
- PVDC (polyvinylidene chloride)

- PVDF (polyvinylidene fluoride)
- PVF (polyvinyl fluoride)
- Urea (urea formaldehyde)

Limited quantities of Group A plastics in mixed commodities shall be used to determine the quantity of Group A plastics allowed that can be stored in a package or carton, or on a pallet without increasing the commodity classification.

Plenum. An air compartment or chamber to which one or more ducts are connected and which form part of an air distribution system.

Portable Tank. Any closed vessel having a liquid capacity over two hundred twenty seven liters (227l) and not intended for fixed installation.

Fire Safety Practitioner. Any qualified person, recognized by the BFP, engaged in, but not limited to, the design, construction, installation, repair and maintenance, assessment, and rehabilitation of fire safety construction, suppression and control systems, protective and warning systems and life safety related services, or employed as a safety officer of public and private establishments/companies.

Pressurized or Forced Draft Burning Equipment. Any type of burner where the fuel is subjected to pressure prior to discharge into the combustion chamber and/or which includes fans or other provisions for the introduction of air at above normal atmospheric pressure into the same combustion chamber.

Propeller. An inclusive term for all parts, appurtenances, and accessories of a propeller.

Proscenium wall. A fire resistive wall which separates a stage or enclosed platform from the public or spectators' area of an auditorium or theater.

Public Way. Any street, alley or other strip of land unobstructed from the ground to the sky, deeded, dedicated or otherwise permanently appropriated for public use.

Pyrophoric. Descriptive of any substance that ignites spontaneously when exposed to air.

Recapping. A process of restoring used tire to a usable condition by bonding new rubber onto the worn tread and lateral surface.

Refining. A process where impurities and/or deleterious materials are removed from a mixture in order to produce a pure element or compound. It shall also refer to partial distillation and electrolysis.

Refrigerating System. An assembly of four (4) major components, namely the compressor, condenser, expansion valve, the evaporator, through which a

very low boiling point substance (refrigerant) flow in cycle, and absorbs heat from the immediate surroundings, thereby producing the cooling effect (also known as the refrigerating effect).

Roll Coating. A process of coating, spreading and impregnating fabrics, paper or other materials as they are passed directly through a tank or trough containing flammable or combustible liquids, or over the surface of a roller revolving partially submerged in a flammable or combustible liquid.

Safety Can. An approved container, of not more than eighteen and nine tenths liter (18.9l)-capacity having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.

Safety Factor. Is the ratio of the design burst pressure to the maximum working pressure and shall not be less than four (4).

Salvage Yards or Shops. An inclusive term that refers to wrecking yards, junk yards or waste material handling plants/shops, which can be used interchangeably.

Self-Closing Doors. Automatic closing doors that are designed to confine smoke and heat and delay the spread of fire.

Smelting. Refers to the process of melting or fusing metallic ores or compounds so as to separate impurities from pure metals.

Smoke Developed Rating. Refers to the rating of a combustible materials based on the density and volume of smoke developed within a certain period of time when its surfaces are ignited.

Smoking Area. A designated area where smoking is permitted within premises where smoking is otherwise generally prohibited.

Solvents or Liquid Classifications. A method of classifying solvents or liquids according to the following:

Class I Solvents. Liquids having a flash point below thirty seven and eight tenths degrees Celsius (37.8°C).

Class II Solvents. Liquids having a flash point at or above thirty seven and eight tenths degrees Celsius (37.8°C) and below sixty degrees Celsius (60°C).

Class IIIA Solvents. Liquids having a flash point at or above sixty degrees Celsius (60°C) and below ninety three and three-tenths degrees Celsius (93.3°C).

Class IIIB Solvents. Liquids having a flash point at or above ninety three and three-tenths degrees Celsius (93.3°C).

Class IV Solvents. Liquids classified as non-flammable.

Source of Ignition. A source of energy sufficient to ignite a flammable atmosphere and includes open flames, smoking, incandescent material, electrical welding arcs, and electrical or mechanical equipment not suitable for use in a particular hazard zone.

Special Bank Receipt (SBR). An accountable form transferred to the AGDB or AGSB thru a Memorandum Receipt (MR) which shall be issued as a proof of payment in the collection of the fees and charges imposed in pursuit of the statutory and regulation functions of the BFP.

Spray Booth. A mechanically ventilated appliance of varying dimensions and construction provided to enclose or accommodate a spraying operation and to confine and limit the escape of spray vapor and residue and to exhaust it safely.

Spraying Area. Any area in which dangerous quantities of flammable vapors or mists, or combustible residues, dusts or deposits are present due to the operation of spraying processes.

Sprinkler System. An integrated network of hydraulically designed piping system installed in a building, structure or area with outlets arranged in a systematic pattern which automatically discharges water when activated by heat or combustion products from a fire.

Stage. A partially enclosed portion of an assembly building which is designed or used for the presentation of plays, demonstrations, or other entertainment activities wherein scenery, drops or other effects may be installed or used, and where the distance between the top of the proscenium opening and the ceiling above the stage in more than one hundred fifty two centimeters (152 cm).

Standpipe System. A system of vertical pipes in a building to which fire hoses can be attached on each floor, including a system by which water is made available to water outlets as needed.

Sump Pit. The lowest part of a mine, vault, tank or a hole in the ground used to collect water, waste water and sludge for purposes of draining through a submersible pump.

Tank Truck. Any single self-propelled motor vehicle equipped with a cargo tank mounted thereon and used for the transportation of flammable and combustible liquids.

Tank Vehicle. Any vehicle carrying or towing a cargo tank used for transporting flammable fluids or hazardous chemicals.

Tank, Full-Trailer. Any vehicle with or without auxiliary motive power, equipped with a cargo tank mounted thereon or built as an integral part thereof, used for the transportation of flammable and combustible liquids, and so constructed that practically all of its weight and load rests on its own wheels.

Tank, Semi-Trailer. Any vehicle with or without auxiliary motive power, equipped with a cargo tank mounted thereon or build as an integral part thereof, used for the transportation of flammable and combustible liquids, and so constructed that, when drawn by a tractor by means of a fifth wheel connection, some part of its load and weight rests upon the towing vehicle.

Thermal Insecticidal Fogging Liquid. Any insecticidal liquid specifically designed for emission from a thermal fog-generating unit in the form of an aerosol fog which is lethal to pest organisms and insects. Examples of thermal insecticidal fogging liquids are permethrin, deltamethrin, cyfluthrin, malathion, pirimiphos methyl and fenithrothion.

Thermal Insecticidal Fogging. The utilization of any insecticidal liquids passed through thermal fog-generating units where, by means of heat, pressure and turbulence, such liquids are transformed and discharged in the form of fog or mist blown into an area to be treated.

Thrust Stage. The portion of a stage which projects into the audience on the audience side of a proscenium wall or opening.

Tote Box. A box constructed for use in the handling of stocks in process or finished stocks while in tote box store rooms.

Toxicity. The degree to which a substance is able to damage an exposed organism.

Used Water. Liquid waste generated by treatment plants, housekeeping, operation and maintenance, and laboratory activities, including but not limited to washing, flushing, and cleaning activities. It also includes the cleaning, flushing and draining water that bear dirt and sludge from sedimentation basin, settling tank, and other treatment processes and unit operation facilities, and backwash water generated in the backwashing, cleaning and flushing of filter media or beds.

Ventilation. The process of supplying or removing air by natural or mechanical means to or from any space. Such air may or may not have been conditioned.

Vertical Shaft. An enclosed vertical space of passage that extends from floor to floor, as well as from the base to the top of a building.

Vestibule. A passage hall or antechamber between the outer doors and the interior parts of a house or building.

Ventilation. Refers to the copious flushing of an area with fresh air for the mitigation of explosion and other fire hazards.

Water Treatment Plants. Single or compact or multi-stage units and/or combination of unit processes and operation systems, including but not limited to their facilities, appurtenances, service areas and premises, for the purification or treatment of raw water or water from a source that requires the removal and/or reduction of impurities or improvement of its quality to comply with water quality standards as prescribed by the concerned government agency, intended for public use or for specific industrial applications.

Waste Water. Liquid waste generated by human activities that use water and/or those water that come from residential, commercial, institutional, recreational, industrial, agricultural and other facilities, similar occupancies and related activities.

Waste Water Treatment Plants. Single or compact or multi-stage units and/or combination of unit processes and operation systems, including but not limited to their facilities, appurtenances, service areas and premises, for the treatment of used water or waste water generated by residential, recreational, institutional, commercial and industrial and other similar occupancies and related activities that required the removal and/or reduction of contaminants and/or pollutants or improvement of its quality to comply with effluent water quality standards of receiving body of water or environment as prescribed by the concerned government agency.

RULE 4. AUTHORITY OF THE CHIEF, BUREAU OF FIRE PROTECTION

SECTION 4.0.0.1 GENERAL AUTHORITY TO ADMINISTER AND ENFORCE RA 9514 AND ITS IRR

The Administration and Enforcement of the Fire Code and this IRR shall be under the direct supervision and control of the Chief, BFP, through the hierarchy of organization as provided for in Chapter VI of Republic Act No. 6975, the DILG Reorganization Act of 1990 as amended by Republic Act No. 9263, the Bureau of Fire Protection (BFP) and Bureau of Jail Management and Penology (BJMP) Professionalization Act of 2004.

SECTION 4.0.0.2 AUTHORITY OF THE CHIEF, BFP SUBJECT TO APPROVAL OF SILG

The Chief, BFP, with the approval of the Secretary, DILG, is hereby authorized to:

- A. Issue implementing rules and regulations, and prescribe standards, schedules of fees/fire service charges and administrative penalties therefore as provided in the pertinent provisions of the Fire Code;
- B. Reorganize the BFP as may be necessary and appropriate;
- C. Enter into long term agreement, either through public biddings or negotiations in accordance with the provisions of Republic Act No. 9184, otherwise known as the Government Procurement Reform Act of 2003, for the acquisition of fire prevention, fire protection and fire fighting investigation, rescue, paramedics, hazardous material handling equipment, supplies, materials and related technical services necessary for the fire service;
- D. Enter into Memoranda of Agreement with other departments, bureaus, agencies, offices and corporations of the government, as well as private institutions, in order to define areas of cooperation and coordination and delineate responsibility on fire prevention education, fire safety, fire prevention, fire suppression and other matters of common concern;

SECTION 4.0.0.3 SPECIFIC AUTHORITY OF CHIEF, BFP

- A. Further, the Chief, BFP or his duly authorized representative, is hereby specifically authorized to:
 1. Support and assist fire volunteers, practitioners and fire volunteer organizations in the country that shall undergo mandatory fire suppression, inspection, rescue, emergency medical services and related emergency response trainings and competency evaluations to be conducted by the BFP. In the case of the fire practitioners, they shall undergo mandatory continuous professional education and competency evaluation of their expertise, knowledge and skills in the area of fire science, engineering and technology to be conducted by the BFP;
 2. Enter into external party agreements for the conduct of trainings, education and evaluation of fire volunteers, practitioners and fire volunteer organizations, which shall be under the full control and supervision of the BFP: Provided, however, that during firefighting operations, fire volunteer organizations shall be under the direct operational control of the fire ground commanders of the BFP;
 3. Call on the police, other law enforcement agencies, and local government assistance to render necessary assistance in the enforcement of the Fire Code and this IRR;
 4. Designate Fire Safety Inspectors (FSI) through his/her duly authorized representative, who shall conduct inspections of every building or structure within his/her area of responsibility at least once a year and

every time the owner, administrator or occupant shall renew his/her business permit or permit to operate;

5. Issue Fire Safety Inspection Certificate (FSIC) as a pre-requisite to the grants of permits and/or licenses by the local governments and other government agencies concerned;
6. Inspect at reasonable time, any building, structure, installation or premises for dangerous or hazardous conditions or materials as set forth in the Fire Code and this IRR, provided that in case of single family dwelling, an inspection must be upon the consent of the occupant or upon lawful order from the proper court. The Chief, BFP or his/her duly authorized representative shall order the owner/occupant to remove hazardous materials and/or stop hazardous operations/processes in accordance with the standards set by the Fire Code and this IRR or other pertinent laws;
7. Order the owner/occupant of any building or structure to summarily abate conditions that are deemed hazardous to life and property;
8. Require the building owner/occupant to submit plans and specifications, and other pertinent documents of said building to ensure compliance with applicable codes and standards; and
9. Issue a written notice to the owner and/or contractor to stop work on any portion of any work due to the absence, or in violation of, approved plans and specifications, permits and/or clearances or certifications as approved by the Chief, BFP or his/her duly authorized representative. The notice shall state the nature of the violation and no work shall be continued on that portion until the violation had been corrected.

B. However, the authority granted under this section should not in anyway diminish the power of the SILG to change, alter, modify, revise or amend the actions of the Chief, BFP.

RULE 5. BFP REORGANIZATION AND PROFESSIONALIZATION

DIVISION 1. REORGANIZATION

SECTION 5.0.1.1 AUTHORITY OF THE CHIEF, BFP TO RECOMMEND REORGANIZATION

To ensure the proper implementation of the Fire Code and this IRR, the Chief, BFP shall, as may be necessary, recommend the reorganization of the BFP.

DIVISION 2. TECHNICAL STAFF

SECTION 5.0.2.1 CONSTITUTION AND QUALIFICATIONS

The Chief, BFP, shall constitute a technical staff of highly qualified persons who are knowledgeable on fire prevention, fire safety, and fire suppression.

SECTION 5.0.2.2 SOURCES

The Technical staff may be drawn from the following:

- A. Organic members of the BFP;
- B. Other government offices and agencies; and
- C. Other sources.

In the case of paragraph "B" and/or "C" above, members may either be appointed into the service or hired as consultants in accordance with existing laws, rules and regulations.

SECTION 5.0.2.3 DUTIES AND FUNCTIONS

The Technical Staff shall:

- A. Study, review and evaluate latest developments and standards on fire safety, prevention and suppression;
- B. Prepare plans/programs on fire safety, prevention and suppression and evaluate implementation thereof;
- C. Develop programs on the professionalization of the fire service;
- D. Coordinate with appropriate government and private institutions for the offering of college courses on fire technology and fire protection engineering;
- E. Propose amendments to the Fire Code and this IRR;
- F. Advise the Chief, BFP on any matter brought to his attention; and
- G. Perform such other functions as directed by the Chief, BFP.

SECTION 5.0.2.4 REMUNERATION

Remuneration for the members of the Technical Staff shall be prescribed by the Chief, BFP in accordance with existing government accounting and auditing rules and regulations.

RULE 6. FIRE BRIGADES, FIRE VOLUNTEER ORGANIZATIONS AND FIRE SAFETY PRACTITIONERS

DIVISION 1. SCOPE

This Rule shall govern the organization, equipage, operation, and proficiency training of company and community fire brigades as well as continuous training and competency evaluation of fire volunteers and fire volunteer organizations in the country who shall undergo mandatory fire suppression, inspection, rescue, emergency medical services and other related emergency response training programs and competency evaluations to be conducted by the BFP. This also prescribes the continuous professional education, competency evaluation and recognition of Fire Safety Practitioners, to be conducted by the BFP. For this purpose, the term "company" shall include government and/or private offices and buildings.

DIVISION 2. ORGANIZATION OF FIRE BRIGADES

SECTION 6.0.2.1 REQUIREMENTS

- A. All business establishments employing at least fifty (50) persons shall, in addition to the requirements set forth under Section 7 of RA 9514 for the grant of Fire Safety Inspection Certificate (FSIC), establish an organization of fire brigade to deal with fire and other related emergencies. The head of the company, through its duly designated safety officer shall evaluate the potential magnitude of a fire emergency within the company, and the availability of firefighting assistance from the BFP to determine the nature of the organization to be established.
- B. For buildings having various occupancies, the Building Administrator and/or owner shall initiate the organization of a fire brigade in the premises irrespective of the number of occupants.
- C. In cases where a fire brigade is already established for a building, said fire brigade shall be sufficient to comply with the requirements of para "A" of this Section.
- D. All barangays shall likewise endeavor to organize their own Fire Brigades.

SECTION 6.0.2.2 COMPOSITION

The organization of company fire brigades shall consist of the Fire Brigade Chief, which shall be designated by the head of the company, and shall be assisted by selected personnel. In companies where more persons are available, they must be organized into teams to function as a fire brigade established according to its needs. The organization shall be such that a fire brigade is on duty or on call at all times.

SECTION 6.0.2.3 COMPONENTS

The equipment that must be put into service at a fire or other related emergencies will determine the number of men required for each operating unit or company into which the brigade is organized, and the total number may be composed of two or more individuals to operate a specific item of equipment or a larger group to perform more complicated operations. Each fire brigade shall have a Leader or a Chief. In his absence, an Assistant Chief shall be appointed.

SECTION 6.0.2.4 DUTIES AND RESPONSIBILITIES OF A FIRE BRIGADE CHIEF

- A. He/She shall be responsible for the development of fire prevention programs and plans of action for the company or organization to address possible fire situation in the plant or community, subject to the approval of the company or establishment head or fire prevention officer;
- B. He/She shall initiate the procurement of necessary firefighting equipment and supplies for use of the brigades;
- C. He/She shall conduct periodic evaluation of all equipment available for firefighting and be responsible for setting in motion necessary procedures for replacing missing equipment or correction of inoperative equipment;
- D. He/She shall also bring to the immediate attention of the company or establishment head, or his fire prevention officer, any situation that would likely reduce the effectiveness of firefighting operations;
- E. He/She shall ensure that the brigades are suitably staffed, conduct periodic review of the fire brigade roster and prepare recommendations on the need for additional members to be selected, appointed and made available to beef up the team;
- F. He/She shall prepare training programs for the members of the fire brigade and supervise its implementation; and
- G. In his/her absence, the Deputy Fire Brigade Chief shall assume and perform the duties and responsibilities of the Fire Brigade Chief.

SECTION 6.0.2.5 QUALIFICATION FOR MEMBERSHIP IN THE COMPANY FIRE BRIGADE

Members of the fire brigade shall consist of persons who have met qualifications appropriate for the fire brigade work. For establishments, members must be taken from the roster of its own workforce. The head of the company shall identify the persons who are fit to perform fire operation activities and further assign them to specific fire suppression positions.

SECTION 6.0.2.6 AVAILABILITY OF PERSONNEL

To qualify as a member of a fire brigade, individuals must be available to respond to fire alarms and attend required training programs. A pre-arranged schedule for availability must be established to prevent conflict of duties and to cover absences such as regular off-duty periods, vacations and sickness.

DIVISION 3. TRAINING OF FIRE BRIGADES, FIRE SAFETY PRACTITIONERS AND FIRE VOLUNTEER ORGANIZATIONS

SECTION 6.0.3.1 CERTIFICATE OF COMPETENCY

A. Certificate of Competency shall be issued to fire volunteers, members of fire brigades and fire safety practitioners after completion of the mandatory training and competency evaluations conducted by the BFP and upon submission of the following documentary requirements:

1. Certificate of completion of the fire suppression training;
2. Personal profile;
3. Certificate of employment, in the case of fire safety practitioners; and
4. Other documents the BFP may require.

SECTION 6.0.3.2 TRAINING DESIGN

A training design shall be developed by the BFP for fire brigades, fire safety practitioners and fire volunteer organizations. Members shall be required to complete the specified program of instruction.

SECTION 6.0.3.3 SCOPE OF TRAINING

- A. All members of the fire brigade shall undergo training on fire suppression, rescue, emergency medical services and related emergency response. They shall be instructed on the handling of available fire rescue apparatus, equipment, devices and tools. The training program shall be adapted to suit the purpose of the particular brigade. It shall include fire suppression strategies, tactics, techniques and the use of portable fire extinguishers and other equipment, devices and tools.
- B. In the case of fire safety practitioners, they shall undergo mandatory continuous professional education and competency evaluation of their expertise, knowledge and skills in the areas of fire science, engineering and technology to be conducted by the BFP.

SECTION 6.0.3.4 ASSISTANCE IN TRAINING PROGRAMS

The BFP shall assist in setting up a training program for the fire brigade and fire volunteer organization. Members of the fire brigade and fire volunteer organization shall be afforded opportunities to improve their knowledge on fire prevention and suppression through attendance in seminars and special training classes.

SECTION 6.0.3.5 IDENTIFICATION

Members of the volunteer fire brigade organization shall wear proper identification cards duly signed by the head of their organization and authenticated by the City/Municipal Fire Marshal having jurisdiction over the area.

DIVISION 4. COMMAND, EQUIPMENT MAINTENANCE AND FIRE DRILLS

SECTION 6.0.4.1 PRACTICE DRILLS

Practice drills shall be held to check the ability of members to perform the operations they are expected to carry out. Drills shall be occasionally held under adverse weather conditions to work on special procedures needed under such circumstances.

SECTION 6.0.4.2 OPERATION OF EQUIPMENT

In practice drills, all available equipment, devices and tools for fire suppression and medical and rescue operation must be operated.

SECTION 6.0.4.3 REACTIVATION OF EQUIPMENT

At the conclusion of a practice drill, equipment shall be made readily available to respond to a fire call.

SECTION 6.0.4.4 INSPECTION AND SCHEDULED MAINTENANCE WORK

Inspection and maintenance of fire equipment, both fixed and portable, may be assigned to individual members of the fire brigade. However, the Fire Brigade Chief must establish the necessary schedules for such work, and assign these duties to specific personnel and ensure that these inspection and maintenance operations are carried out and reported.

SECTION 6.0.4.5 COMMAND AT FIRE SCENE

During firefighting operations, the fire brigades and fire volunteer organizations shall be under the direct operational control of the fire ground commanders of the BFP.

RULE 7. ASSISTANCE AND SUPPORT TO THE BFP

DIVISION 1. POLICE AND OTHER LAW ENFORCEMENT SUPPORT

SECTION 7.0.1.1 FROM PHILIPPINE NATIONAL POLICE

Upon request, the Philippine National Police (PNP) shall render necessary assistance to the Chief, BFP or his duly authorized representative on the following actions:

- A. During actual fire fighting operations and fire scene investigations;
- B. Business closure and summary abatement proceedings;
- C. Installation of signs that the building/structure is a fire hazard and/or fire trap;
- D. Obstruction of designated fire lanes and fire hydrants;
- E. Apprehension of violators/persons removing, destroying, tampering or obliterating warning signs and similar abatement appurtenances; and
- F. Such other duties and functions of the BFP which would essentially require police assistance.

SECTION 7.0.1.2 FROM LOCAL GOVERNMENT UNITS

Local Government Units (LGU) and other government agencies shall render necessary assistance on the following duties of the BFP:

- A. Strict observance of the requirement of fire safety measures for the issuance of Fire Safety Inspection Certificate (FSIC) as a pre-requisite in the grant of and renewal of business, occupancy and other related permits/licenses. For this purpose, the LGU and/or other government agencies concerned shall refrain from issuing such licenses and/or permits without the applicant first securing an FSIC from the BFP;
- B. Organization and training of fire brigades in all barangays in partnership with BFP to serve as first responders;
- C. In summary abatements, closure and/or stoppage of operation of buildings/structures or portions thereof; and
- D. Such other duties and functions of the BFP which would essentially require their assistance.

SECTION 7.0.1.3 FROM OTHER LAW ENFORCEMENT AGENCIES

Other Law Enforcement Agencies, such as but not limited to, National Bureau of Investigation and Philippine National Police Crime Laboratory shall, upon request, accommodate and render necessary assistance on the following functions of the BFP:

- A. Laboratory/physical examinations of the pieces of evidence gathered in the fire scene and submit the result thereof to the Chief, BFP or his duly authorized representative, as the case may be;
- B. In the investigation and prosecution of arson cases, appear as expert witness thereof;
- C. Such other duties and functions of the BFP which require their expertise.

DIVISION 2. OTHER AGENCIES' SUPPORT

SECTION 7.0.2.1 COORDINATION WITH OTHER AGENCIES

To institutionalize the areas of cooperation and coordination of the BFP with other departments, bureaus, agencies, offices and corporations of the government, as well as private institutions, the BFP may enter into Memoranda of Agreement with, but not limited to, the following:

- A. National and Local Waterworks, for providing sufficient source of water, especially in times of fire or conflagration and for the establishment of fire hydrants in strategic areas;
- B. Electric Companies and Cooperatives, on the immediate cut-off of electric main lines/power lines during fires or conflagration to avoid the danger of the people being electrocuted;
- C. Department of Transportation and Communication (DOTC), on fire safety measures on all ports and land transportation vehicle, traffic flow during fire operation and establishment of effective communication system for the BFP;
- D. Department of Education (DepED), on institutionalizing the kiddie and junior fire marshal program in all pre-school, elementary and secondary education levels;
- E. Commission on Higher Education (CHED), on coordinating with state academic institutions to develop and promote fire safety engineering courses and post graduate studies on fire science and technology and development of fire testing laboratories;

- F. Department of Trade and Industry (DTI), on instituting continuing development and enhancement of standards on fire protection and related fire and life safety facilities, equipage and systems;
- G. Technical Education Skills Development Authority (TESDA), on providing and enhancing technical skills and know-how of BFP personnel and fire volunteer organizations as well as their subsequent accreditation/certification.
- H. Department of Environment and Natural Resources (DENR), on providing pertinent information in the field of hazardous materials and hazardous waste management as well as collaboration on forest fire and life safety programs.
- I. Such other government agencies, instrumentalities and subdivisions and non-government institutions, with respect to future concerns as may be deemed necessary by the BFP in furtherance of the enforcement of the Fire Code and this IRR.

RULE 8. FIRE SAFETY ENFORCERS

CHAPTER 1. QUALIFICATIONS OF FIRE SAFETY ENFORCERS

DIVISION 1. MINIMUM REQUIREMENTS

BFP personnel duly designated as Fire Safety Enforcers shall possess minimum required qualification standard stated herein.

SECTION 8.1.1.1 FIRE SAFETY INSPECTORS

A. UNIFORMED PERSONNEL

- 1. Licensed Engineer (Civil, Electrical, Mechanical, Chemical, Sanitary and Electronic and Communication); or Architect with at least one (1) year in the BFP service; or Graduate of any baccalaureate degree course with at least three (3) years in the BFP service;
- 2. Shall have completed Fire Arson Investigation and Inspection Course (FAIIC); or have undergone at least forty (40) hours of relevant seminars/workshops on the Fire Code of the Philippines of 2008 and other relevant fire safety seminars/workshops; and
- 3. Non-licensed and non-engineering graduate must pass the written fire safety inspection examination conducted by the BFP.

B. NON- UNIFORMED PERSONNEL

1. Appointed as Engineers (Civil, Electrical, Mechanical, Chemical, Sanitary and Electronics and Communication); or Appointed as Electrical/Building Inspectors; and
2. Shall have undergone at least forty (40) hours of relevant seminars/workshops on the Fire Code of the Philippines and other relevant fire safety seminars/workshops.
3. Electrical/building inspectors must pass the written examination conducted by the BFP, otherwise they can only conduct inspection relative to their appointment's duties and functions.

SECTION 8.1.1.2 PLAN EVALUATORS

- A. Must be a licensed Architect or Engineer; and
- B. Shall have undergone at least forty (40) hours of relevant training on the Fire Code of the Philippines of 2008 and other relevant fire safety seminars/workshops.
- C. In cases where there is no licensed engineer or architect in a specific jurisdiction, a graduate of any baccalaureate degree with FAIIC training shall be designated as plan evaluator.

CHAPTER 2. FUNCTIONS OF FIRE SAFETY ENFORCERS

DIVISION 1. RESPONSIBILITIES OF DESIGNATED FIRE SAFETY ENFORCERS

SECTION 8.2.1.1 FIRE SAFETY INSPECTORS

The following shall be the main duties and responsibilities of Fire Safety Inspectors:

- A. Inspect any building, structure or facility and/or any part thereof, hazardous operations, storage facilities and transportation vehicles of hazardous materials to ensure compliance of the Fire Code of the Philippines, this IRR and other related laws, regulations, standards and ordinances within the area of responsibility;
- B. Assess compliance with the fire safety requirements, identify and recommend corrective actions for violations/defects and deficiencies and inform the owner/building administrator/occupants of such actions to comply with the provisions of the Fire Code of the Philippines, this IRR and other related laws, regulations, standards and ordinances;

- C. Testify in any judicial and quasi-judicial bodies regarding matters relating to the Fire Code of the Philippines and this IRR, and/or the performance of his/her duties related thereto, when needed;
- D. Conduct fire safety lectures, seminars/workshop and drills; and
- E. Prepare necessary documents and maintain files and/or records.

SECTION 8.2.1.2 PLAN EVALUATORS

The following shall be the main duties and responsibilities of Plan Evaluators:

- A. Review and evaluate building plans and specifications including fire protection system to determine compliance to the requirement of the Fire Code, this IRR, Building Code of the Philippines and other Life and Safety Standard; and
- B. Conduct site verification and inspection on building under construction to determine compliance with the approved plans and specifications.

RULE 9. ENFORCEMENT AND ADMINISTRATION OF FIRE SAFETY MEASURES

DIVISION 1. GENERAL

- A. Inspection of all buildings, structures, facilities and premises, hazardous operations, storage facilities and transportation vehicles of hazardous materials and the determination of compliance of provisions of the Fire Code of the Philippines and this IRR shall be done by City/Municipal Fire Marshal having jurisdiction.
- B. Fire safety inspections shall be conducted as a pre-requisite to grants of permits and/or licenses by local governments or other government agencies. No occupancy permit, business or permit to operate shall be issued without securing a Fire Safety Inspection Certificate (FSIC) from the City/Municipal Fire Marshal having jurisdiction.
- C. In coordination with the Building Official, the City/Municipal Fire Marshal having jurisdiction shall review, evaluate and assess plans, design calculations and specifications, and issue the necessary building Fire Safety Evaluation Clearance (FSEC) upon determination that design and specification is in accordance with the provisions of the Fire Code of the Philippines and this IRR.

DIVISION 2. FIRE SAFETY EVALUATION AND INSPECTION

SECTION 9.0.2.1 BUILDING PLAN REVIEW

- A. Upon receipt by the City/Municipal Fire Marshal having jurisdiction of six (6) sets of the building plans from the Building Official (BO), the Costumer Relation Officer or the designated staff shall check compliance of documentary requirements, assess the Fire Code Fees (FCF) and issue Order of Payment (OP) to be paid at the Cashier's Office or the Authorized Government Depository Bank (AGDB) or Authorized Government Servicing Bank (AGSB) by the BFP. After payment of FCF, the owner or his duly authorized representative shall submit copy of the Official Receipt (OR). The Costumer Relation Officer shall record the application for Building Plan Review including the date and time the plans were received and the OR No., acknowledge and assign a control number and endorse the same without delay to the Plan Evaluator.
- B. The Plan Evaluator shall undertake the necessary evaluation and review of the plans indicating whether or not such plans conform to the fire safety and life safety requirements of the Fire Code of the Philippines and this IRR. For this purpose, a Fire Safety Checklist (FSC) shall be used to facilitate checking of the building plan. The evaluated plans and the corresponding FSC shall then be submitted to the Chief, Fire Safety Enforcement Section (FSES).
- C. The Chief, FSES shall consolidate and review the findings of the Plan Evaluator and shall submit, without delay, the evaluation report and/or recommendations to the City/Municipal Fire Marshal having jurisdiction.
- D. The City/Municipal Fire Marshal having jurisdiction will either approve or disapprove the evaluated plans together with FSC. The approved/disapproved application for FSEC will then be transmitted to the Costumer Relation Officer for its release.
- E. No building plan shall be evaluated without the submission of Fire and Life Safety Assessment Report 1 (FALAR 1) in accordance with Division 3 of this Rule.
- F. The City/Municipal Fire Marshal having jurisdiction, through the Costumer Relation Officer shall endorse back five (5) copies of the approved Building Plans, together with the FSEC and FSC to the Building Official.

SECTION 9.0.2.2 INSPECTION DURING CONSTRUCTION

During construction, renovation, modification or alteration, the City/Municipal Fire Marshal having jurisdiction, on the basis of issued FSC, shall inspect the premises to determine whether the plans, and specifications are being followed and fire safety precautions are being

observed. He shall cause the correction of any defects/deficiencies noted, when necessary.

SECTION 9.0.2.3 INSPECTION AFTER COMPLETION OF CONSTRUCTION

- A. After construction/ renovation/ modification or alteration and prior to the issuance of the occupancy permit by the Building Official, the City/Municipal Fire Marshal having jurisdiction shall inspect the premises and issue the necessary Fire Safety Inspection Certificate (FSIC) upon determination that the required fire safety construction are in place, and fire protective and/or warning system are properly installed in accordance with the approved plans and specifications.
- B. Inspection procedure shall be as follows:
 1. The process starts with the endorsement by the Building Official (BO) of the application for Occupancy Permit accompanied by a Certificate of Completion. The Customer Relation Officer or designated staff shall assess the Fire Code Fees and issue Order of Payment to be paid at the Cashier's Office or the AGDB or AGSB of the BFP. After payment, the owner shall submit a copy of the Official Receipt to the Customer Relation Officer. The Customer Relation Officer shall then assign an application control number on the endorsement/application and prepare an Inspection Order.
 2. The prepared Inspection Order will be forwarded to Chief, FSES for signing and recommendation.
 3. The Chief, FSES will endorse the said Inspection Order including the name of assigned FSI to the City/Municipal Fire Marshall having jurisdiction for approval and signature. The Inspection Order will then be given back to the Record Section for the assignment of a control number and dispatch to assigned FSI.
 4. The FSI shall conduct final inspection in the establishment applying for Occupancy Permit then shall prepare an After Inspection Report (AIR) using the Classified Standard Checklist.
 5. The FSI will prepare a report of recommendation (FSIC or Notice of Disapproval (NOD)), which shall be submitted to the Chief, FSES. The FSI will prepare the FSIC, to be signed by Chief, FSES if said establishment has substantially complied with the provisions of the Fire Code of the Philippines. Otherwise, the FSI shall prepare NOD.
 6. The Chief, FSES will evaluate and recommend final action, which is subject to the approval of the City/Municipal Fire Marshall having jurisdiction.

7. No FSIC shall be issued without the submission of Fire and Life Safety Assessment Report 2 (FALAR 2) in accordance with Division 3 of this Rule.
8. Upon approval or disapproval, the City/Municipal Fire Marshall having jurisdiction shall issue an FSIC or NOD, as the case may be, and endorse to BO/Owner, retaining one (1) copy for filing and properly maintained for future reference.

SECTION 9.0.2.4 BUSINESS AND ROUTINE INSPECTION

A. Existing Building, Structure or Facility

The City/Municipal Fire Marshal having jurisdiction shall inspect all buildings, structures or facilities to determine the presence of any fire hazard, the types of occupancy, the prohibited acts being committed as provided in Section 7 of Republic Act 9514, and to check or test the required fire protective and/or warning systems. For this purpose, the building owner or administrator shall make available to the FSI copies of all plans, design calculations and specifications of the building as it was actually built/ constructed, or in the absence of the same, copies of all plans, design calculations and specifications of the building as it is at the time of the inspection. The provisions of Section 9.0.2.2 apply when the building, structure or facility will be repaired, renovated or modified as a consequence of the inspection.

B. Industrial, Commercial or Business Operation

The City/Municipal Fire Marshal having jurisdiction shall cause the inspection of premises of any industrial, commercial or business operations and issue the necessary FSIC upon determination that fire safety measures for storage, handling, and/or use of explosives or combustible, flammable, toxic and other hazardous materials, as well as, for hazardous operations or processes, have been complied.

C. Periodic Inspection by Fire Safety Inspectors

The City/Municipal Fire Marshal having jurisdiction shall cause the conduct of periodic fire safety inspection of any building, structure, facility or premises for the purpose of determining compliance with the provisions of the Fire Code and this IRR. For this purpose, Inspection Order shall be issued by the City/Municipal Fire Marshal having jurisdiction. Before leaving the place inspected, report shall be prepared. Such inspection Order and After Inspection Report shall conform to the herein prescribed format, prepared in three sets and distributed as indicated. Format of the After Inspection Report shall follow the approved fire safety standard inspection checklist.

D. No FSIC shall be issued without the submission of Fire and Life Safety Assessment Report 3 (FALAR 3) in accordance with Division 3 of this Rule.

DIVISION 3. FIRE AND LIFE SAFETY ASSESSMENT REPORT

SECTION 9.0.3.1 APPLICABILITY

- A. All private and public buildings, facilities and structures to be constructed or being constructed upon the effectivity of this IRR shall be required to submit FALAR 1 and 2, among other documents, to the City/Municipal Fire Marshal having jurisdiction as one of the requirements for securing FSEC or FSIC for the issuance of Building Permit and Occupancy Permit.
- B. All existing private and public buildings, facilities or structures with occupancy of at least fifty (50) persons shall be required to submit FALAR 3 annually to the City/Municipal Fire Marshal having jurisdiction when securing FSIC.

SECTION 9.0.3.2 PROCEDURES

- A. Three (3) sets of FALAR 1 shall be submitted to the City/Municipal Fire Marshal having jurisdiction by the building owner duly signed by the Architect and Fire Safety Practitioner duly accredited by the BFP, together with six (6) sets of plans and specifications. The City/Municipal Fire Marshal having jurisdiction shall not issue a FSEC for the issuance of Building Permit without the submission of FALAR 1.
- B. Prior to beneficial occupancy, together with the Certificate of Completion of Construction, three (3) sets of FALAR 2 shall be submitted to the City/Municipal Fire Marshal having jurisdiction by the building owner, duly signed by the Construction Manager and Contractor. The City/Municipal Fire Marshal having jurisdiction shall not issue a FSIC as a requirement for the issuance of Occupancy Permit without the submission of FALAR 2.
- C. The building owner shall make available for submission to the City/Municipal Fire Marshal having jurisdiction, three (3) sets of FALAR 3, duly signed by the Building Administrator during the regular annual fire safety inspection. The City/Municipal Fire Marshal having jurisdiction shall not issue a FSIC as a requirement for the issuance of Business Permit without the submission of FALAR 3.

SECTION 9.0.3.3 FORMAT OF PREPARATION

- A. **FALAR 1** - Documentation on Fire and Life-Safety Features of the Facility

(Consisting of a written report prepared by the Architect and his Fire Protection Consultant. This is a compilation of the plans/specification and design analysis normally submitted by the Architect and Engineers.)

1. Objectives
2. Short Project Description
3. Statement of who is the enforcing authority for the National Building Code and the Fire Code of the Philippines.
4. Statement of the Codes and Standards used in the design.
5. Discussion of Fire Protection and Life Safety Issues.
 - a. Building Classification and Construction;
 - b. Hazards of contents and combustible loading including fire scenarios adopted if design is performance based;
 - c. Occupancy Classification;
 - d. Structural Requirements/Separation of Building Spaces;
 - e. Exit and egress description
 - i. Basis of design;
 - ii. Number of exits;
 - iii. Travel distances;
 - iv. Exit calculations (may be included in appendices); and
 - v. Timed-exit analysis (for equivalencies and variances);
 - f. Fire Suppression Description
 - i. Design criteria used for sprinkler system/standpipe;
 - ii. Other suppression systems;
 - iii. Water supplies, and fire pumps, capacities;
 - iv. Portable extinguishers;
 - v. Hydraulic and other calculations (may be placed in appendices); and
 - vi. Riser diagrams (may be placed in appendices);
 - g. Fire detection, alarm, communication and evacuation systems
 - i. Description of each system including features and controls; and
 - ii. Sound pressure calculations (for equivalencies and variances);
 - h. Smoke Control Management
 - i. Description of smoke control strategies;
 - ii. Design criteria used;
 - iii. Calculations (may be included in appendices); and

- iv. Equipment capacities and description
 - i. Exit light and emergency lighting systems
 - i. Description;
 - ii. Typical location of exit lights and emergency lighting systems;
 - iii. Design criteria; and
 - iv. Calculations (equivalencies and variances).
 - j. Emergency Power Supply
 - i. Description;
 - ii. Capacities; and
 - iii. Calculations (may be included in appendices)
 - k. Fire Department Access
 - i. Description and location of street hydrant and BFP station; and
 - l. Other issues not discussed above including elevator recall and use of elevators for evacuation

B. **FALAR 2** - Documentation submitted by the Contractor/s and the Construction Manager certifying that the construction was in accordance with the FALAR 1 and authorized changes.

(Documents will be a compilation report of all approved submittals, test and acceptance forms of all fire protection and life safety features and shall form part of the as-built documents turned over by the contractor to the building owner.)

- 1. Short Description of Project.
- 2. Objectives of the Report.
- 3. Enforcing Authorities.
- 4. Standards used for Authorized Changes.
- 5. Fire Protection and Life Safety Issues.
 - a. Building classification and construction - a statement saying there is no deviation from FALAR 1.
 - b. Hazards of content and combustible loadings - description of authorized changes from FALAR 1. If none, a statement saying none.

- c. Occupant characterization- description of any changes from FALAR 1. If none, a statement saying none.
- d. Structural requirements and separation of building spaces and description of authorized changes from FALAR 1.
- e. Exit and Egress
 - i. Calculations (for changes and variances)
 - ii. Description of authorized major changes to FALAR 1.
 - iii. Egress calculation for variances from code requirements.
- f. Fire Suppression Systems
 - i. Description of authorized major changes to FALAR 1.
 - ii. Calculations for major changes (maybe included in appendices)
- g. Fire detection, alarm, communication and evacuation systems
 - i. Description of authorized major changes.
 - ii. Calculation for major changes.
 - iii. Testing, commissioning and acceptance data of the fire alarm and detection system.
 - iv. Testing, commissioning and acceptance data including fire and jockey pumps
- h. Smoke Control Management
 - i. Description of Authorized Changes
 - ii. Calculation for major changes
 - iii. Testing, commissioning and acceptance data for smoke exhaust and pressurization blowers
- i. Emergency Power Supply
 - i. Description of authorized changes
 - ii. Calculation for major changes
 - iii. Testing, commissioning and acceptance data of the generator set.
- j. Other issues including testing and commissioning of the elevator recall system.

C. **FALAR 3** - Documentation on the required periodic maintenance and upkeep of the fire and life-safety features of the facility.

(It consists of a written report prepared by the building owner, his fire safety officer or his authorized representative. This is a compilation of the

maintenance and testing records kept by the buildings engineering and maintenance departments.)

1. Objectives
2. Short Description of Building or Facilities.
3. Statement on who is the enforcing authority for the National Building Code and the Fire Code of the Philippines.
4. Statement of Testing and Maintenance Standards Used.
5. Discussions of Fire Protection and Life Safety Issues.
 - a. Building Classification and Construction.
 - b. Hazards of Content and Combustible Loadings.
 - c. Occupancy Classifications.
 - d. Separation of Building Spaces.
 - e. Exit and Egress
 - i. Number of active exits; and
 - ii. Maintenance records done on egress component such as doors and enclosed stairways.
 - f. Fire Suppression
 - i. Maintenance and testing records done on fire pumps, sprinkler system, portable extinguishers, standpipes and other fire suppression systems; and
 - ii. Submit results of annual fire pump flow tests, annual main drain tests, and water flow tests for standpipe; submit other test results as appropriate.
 - g. Fire detection, alarm communication and evaluation system
 - i. Testing and maintenance records done on the components of the detection and alarm system including the fire alarm control panel.
 - h. Smoke Control Management
 - i. Maintenance and testing records of the various component of the smoke management system. Include test records for pressurization fans for flows and fan controls.
 - i. Emergency Power Supply

- i. Maintenance and testing records of the system components of the emergency power supply.
- j. Other testing and maintenance records, including test results of the elevator recall system.

DIVISION 4. FIRE SAFETY INSPECTION CERTIFICATE

SECTION 9.0.4.1 FSIC AS A PRE-REQUISITE FOR ISSUANCE OF PERMIT/LICENSE

Upon compliance of the fire safety requirements under Rule 10 of this IRR, a Fire Safety Inspection Certificate (FSIC) shall be issued by the BFP as a pre – requisite for the issuance of Business or Mayor's Permit, Permit to Operate, Occupancy Permit, PHILHEALTH Accreditation for Hospitals, DOH License to Operate and other permits or licenses being issued by other government agencies.

SECTION 9.0.4.2 DOCUMENTARY REQUIREMENTS

A. FSIC for Occupancy Permit

1. Endorsement from the Building Official (BO);
2. Photocopy of Building Permit and Assessment of Occupancy Permit Fee;
3. Copy of Fire Insurance Policy, if any;
4. Copy of Latest Fire Safety Inspection Certificate immediately preceding this application, if any; and
5. Three (3) sets of FALAR 2.

B. FSIC for Business Permit

1. Endorsement from the Business Permit Licensing Office (BPLO);
2. Photocopy of Building Permit and Assessment of Business Permit Fee/Tax Bill for Business Permit;
3. Copy of Fire Insurance Policy, if any;
4. Copy of Latest Fire Safety Inspection Certificate immediately preceding this application, if any; and
5. Three (3) sets of FALAR 3.

DIVISION 5. FIRE SAFETY CLEARANCE

Fire Safety Clearance shall be required for the storage, handling, installation and transportation of hazardous materials, operations and processes as may be prescribed in other provisions of this IRR.

DIVISION 6. FIRE INSURANCE DATA REQUIRED

All persons having fire insurance coverage on their properties and/or business shall submit a certified true copy of all coverages currently in effect, including subsequent and/or additional policies to the City/Municipal Fire Marshal having jurisdiction not later than ten (10) days after receipt of the document from any insurance company. Exempted from this requirement are owners of detached, single- or two-family dwellings actually being used for residential occupancy.

RULE 10. FIRE SAFETY MEASURES

CHAPTER 1. COVERAGE

This Rule covers the Fire Safety Measure for Buildings, Structures and Facilities, Hazardous Materials and Wastes, Hazardous Operations and Processes and Miscellaneous Hazardous Premises and/or conditions, that by its very nature or relation to life, property and environment poses threat or danger.

CHAPTER 2. FIRE SAFETY IN BUILDINGS, STRUCTURES AND FACILITIES

DIVISION 1. SCOPE

- A. This Chapter deals with life safety from fire and like emergencies in buildings, structures and facilities. It covers construction, protection and occupancy features to minimize danger to life from fire, smoke, vapor and fumes before buildings are vacated. It also discusses procedures and guidelines in fire drills required for all types of occupancies to prevent panic in times of emergencies. It specifies the number, size, and arrangement of means of egress sufficient to permit prompt and safe escape of occupants from buildings, or structures or facilities in case of fire or other conditions dangerous to life and property.
- B. Nothing in this Chapter shall be construed to prohibit a better type of design, building construction, more exits, or otherwise safer conditions than the requirements specified in this Chapter.

DIVISION 2. GENERAL REQUIREMENTS

- A. Every building or structure, new or old, designed for human occupancy shall be provided with exits sufficient to permit the fast and safe escape

of occupants in case of fire or other emergency. The design of exits and other fire safety construction shall be such that reliance for safety to life in case of fire or other emergency will not depend solely on any single fire safety construction. Additional safeguards shall be provided for life safety in case any single safeguard is ineffective due to some human or mechanical failure.

- B. Every building or structure shall be designed, constructed, equipped, maintained and operated to avoid danger to the lives and ensure safety of its occupants from fire, smoke, vapor and fumes, during the period of escape from the building or structure.
- C. Every building or structure shall be provided with exits of kind, number, location and capacity appropriate to the individual building or structure, with due regard to the character of the occupancy, the number of persons exposed, the fire protection available and the height and type of construction of the building or structure, to afford all occupants convenient facilities for escape.
- D. Every exit of buildings or structures shall be arranged and maintained to provide free and unobstructed egress from all parts thereof at all times. No lock or fastening device that would prevent escape from the inside of any building shall be installed except in mental, penal, or correctional institutions where personnel are continually on duty and effective provisions are made to evacuate occupants in case of fire or other emergencies.
- E. Every exit shall be clearly visible. The route to the exit shall be conspicuously marked in such a manner that every occupant of a building or structure will readily know the direction of escape. Each route of escape, in its entirety, shall be so arranged or marked that the way to a place of safety outside is unmistakable. Any doorway not constituting an exit shall be marked to minimize its possible confusion as an exit. Likewise, passage constituting a way to reach an exit shall be marked to minimize confusion.
- F. All means of egress shall be provided with adequate and reliable illumination.
- G. Fire alarm systems or devices shall be provided in every building or structure of such size, arrangement, or occupancy, to provide adequate warning to occupants.
- H. Every building or structure, section, or area thereof of such size, occupancy and arrangement such that the reasonable safety of a number of occupants may be endangered by the blocking of any single means of egress due to fire or smoke, shall have at least two means of egress remote from each other, so arranged as to minimize any possibility

that both may be blocked by any one fire or other emergency conditions.

- I. Every vertical way of exit and other vertical openings between floors of a building shall be suitably enclosed or protected to afford reasonable safety of occupants while using exits and to prevent spread of fire, smoke, or fumes through vertical openings from floor to floor before occupants have entered exits.

J. Required Fire Safety Programs/Measures

1. In addition to the requirements, lessees or occupants of buildings, structures or facilities shall observe all pertinent fire safety measures;
2. All occupants or lessees of buildings, structures or facilities shall organize themselves and develop and implement fire safety programs to include among others, fire prevention in the premises, notification of the BFP on the existence of a fire, evacuation of persons and initial fire fighting. The building owner shall take the initiative of formulating the fire safety program for his building and of organizing the occupants to implement the programs.
3. In buildings, leased to and used by one or several companies or persons, the management of each company or each person shall be responsible for fire safety measures within the leased or occupied areas. The building owner shall be responsible for the common areas in the building such as the means of egress, utilities and building service equipment or systems.
4. In building structures or facilities, such as condominium and the like, where some units of the building are not yet sold, the provisions of paragraph "J" sub-para "3" above shall apply. When all condominium units have been sold, responsibility for fire safety measures in the common areas such as the means of egress, utilities, building equipment/system and the building as a whole, shall devolve jointly upon all individual unit owners or occupants.
- K. Compliance with this Chapter shall not be construed as eliminating or reducing the necessity from complying with the other provisions for safety of persons using a structure under normal occupancy conditions. Also, no provision of the Fire Code of the Philippines and this IRR shall be construed as requiring or permitting any condition that might be hazardous under normal occupancy conditions.

L. Construction and Repair Operations

1. New Construction

- a. No building or structure under construction shall be occupied in

whole or in part until all required means of egress required for the part to be occupied are completed, inspected and approved for occupancy.

b. Adequate escape facilities shall be maintained at all times in buildings under construction for the use of construction workers. These facilities shall consist of doors, walkways, stairs, ramps, fire escapes, or other arrangements in accordance with the general guidelines of the Fire Code of the Philippines and this IRR in so far as they can reasonably be applied to buildings under construction.

2. Repairs or Alterations

a. Existing buildings may be occupied during repairs or alterations provided that all existing fire protection systems/devices are continuously maintained or, in lieu thereof, other measures are taken to provide equivalent safety.

b. Flammable or explosive substances or equipment necessary for the repair or alteration of a building or structure may be introduced therein while it is occupied, only if the conditions of use and the safeguards therefore provided will not create any additional danger or impair the use of the means of egress.

DIVISION 3. CLASSIFICATION OF OCCUPANCY

A. A building or structure shall be classified as follows:

1. **Assembly**

a. Assembly occupancies include, but are not limited to, all buildings or portions of buildings used for gathering together of fifty (50) or more persons for such purposes as deliberation, worship, entertainment, eating, drinking, amusement, awaiting transportation, or similar uses.

b. Assembly occupancies include: theaters; assembly halls; auditorium; exhibition halls; museum; restaurants; drinking establishments; places of worship; classrooms of 50 persons and over capacity; libraries; internet shops of over 50 persons capacity; dance halls; club rooms; skating rinks; gymnasiums; cockpit arenas; bowling facilities; pool rooms; armories; passenger stations and terminals of air, surface, underground, and marine public transportation facilities; recreational facilities; piers; court-rooms; conference rooms; and mortuary chapels or funeral homes.

c. Restaurants and drinking establishments with an occupant load of less than 50 persons shall be classified as mercantile occupancies.

d. Occupancy of any room or space for assembly purposes by less than fifty (50) persons in a building of other occupancy and incidental to such other occupancy shall be classified as part of the other occupancy and subject to the provisions applicable thereto.

2. Educational

- a. Educational occupancies include all buildings or portions thereof used for the gathering of group of six (6) or more persons for purposes of instruction.
- b. Educational occupancies include: Schools; Universities; Colleges; Academies; Nursery schools; Kindergartens; and Child Day Care facilities.
- c. Other occupancies associated with educational institutions shall be in accordance with the appropriate parts of this Chapter, except licensed day care facilities of any capacity.
- d. In case where instruction is incidental to some other occupancy, the Section of the Chapter governing such other occupancy shall apply.

3. Health Care

- a. Health care facilities are those used for purposes of medical or other treatment or care of persons where such occupants are mostly incapable of self preservation because of age, physical or mental disability, or because of security measures not under the occupants' control.
- b. Health care facilities include: hospitals; nursing homes; birth centers; and residential custodial care centers such as nurseries, homes for the aged and the like.

4. Detention and Correctional

- a. Detention and correctional buildings are those used to house one or more persons under varied degrees of restraint or security where such occupants are mostly incapable of self-preservation because of security measures not under the occupants' control.
- b. Detention and correctional occupancies shall include those used for purposes such as correctional institutions, detention facilities, community residential centers, training schools, work camps, and substance abuse centers where occupants are confined or housed under some degree of restraint or security.

5. Residential

- a. Residential occupancies are those occupancies in which sleeping accommodations are provided for normal residential purposes and include all buildings designed to provide sleeping accommodations.
- b. Residential buildings, structures or facilities are treated separately in this Rule in the following groups: hotels; motels; apartelles; pension houses; inns; apartments; condominiums; dormitories; lodging or rooming houses; and one- and two-family dwellings; and the likes.

6. Mercantile

- a. Mercantile occupancies include stores, markets, and other rooms, buildings, or structures for the display and/or sale of merchandise.
- b. Mercantile occupancies include: malls; supermarkets; department stores; shopping centers; flea markets; restaurants of less than 50 persons capacity; public/private dry and wet markets; water refilling stations; drugstores; hardwares/construction supplies; showrooms; and auction rooms.
- c. Minor merchandising operation in building predominantly of other occupancies, such as newsstand in an office building, shall be subject to the exit requirements of the predominant occupancy.
- d. Office, storage, and service facilities incidental to the sale of merchandise and located in the same building should be considered part of the mercantile occupancy classification.

7. Business

- a. Business buildings are those used for the transaction of business other than that covered under Mercantile, for the keeping of accounts and records and similar purposes.
- b. Included in this occupancy group are: offices for lawyers; doctors; dentists and other professionals; general offices; City/Municipal halls; internet shops; massage parlors, beauty parlors, barbershops of less than 50 occupants and court houses;
- c. Minor office occupancy incidental to operations in other occupancy shall be considered as a part of the dominant occupancy and shall be subject to the provisions of the Chapter applying to the dominant occupancy.

8. Industrial

- a. Industrial occupancies include factories that make products of all

kinds and properties which shall include but not limited to product processing, assembling and disassembling, mixing, packaging, finishing or decorating, repairing and material recovery including, among others, the following: factories of all kinds; laboratories; dry cleaning plants; power plants; pumping stations; smokehouses; gas plants; refineries; and sawmills, laundries; creameries

9. Storage

- a. Storage occupancy includes all buildings or structures utilized primarily for the storage or sheltering of goods, merchandise, products, vehicles, or animals. Included in this occupancy group are: warehouses; cold storages; freight terminals; truck and marine terminals; bulk oil storage; LPG storage; parking garages; hangars; grain elevators; barns; and stables.
- b. Minor storage incidental to other occupancy shall be treated as part of the other occupancy.

10. Mixed Occupancies

- a. Refers to two or more classes of occupancies occurring/located/situated/existing in the same building and/or structures so intermingled that separate safeguards are impracticable.
- b. The means of egress shall be sufficient to meet exit requirements for the occupants of each individual room or section, and for the maximum occupant load of the entire building. Fire safety construction, protective and warning systems and other safeguards shall met requirements of the most hazardous occupancy unless otherwise specified in Division 8 through 17 of this Chapter.

11. Miscellaneous

- a. This class of occupancy includes buildings or structure which cannot be properly classified in any of the preceding occupancy groups. Such miscellaneous buildings and structures shall conform to the fundamental guidelines provided for in Division 2 and to any specific provisions applicable thereto in Division 17 both of this Chapter.
- B. In case of conflict as to the type or classification of occupancy, the same shall be determined by the Chief, BFP or his duly authorized representative.

DIVISION 4. HAZARD OF BUILDINGS

SECTION 10.2.4.1 GENERAL

- A. For purposes of this Chapter, the degree of hazard shall be the relative danger of the start and spread of fire, the generation of smoke or gases, the danger of explosion or other occurrences potentially endangering the lives and safety of the occupants of the building or structure due to the nature of the contents or processes/operations therein.
- B. The degree of fire hazard shall be determined by the City/Municipal Fire Marshal having jurisdiction on the basis of the nature, character of the contents and the process or operations being conducted in the building or structure: Provided, however, that where the flame spread rating of the interior finish or other features of the building or structure are such as to involve a fire hazard greater than the hazard of contents, the greater degree of fire hazard shall govern, except if such hazardous areas are segregated or protected as specified in Section 10.2.6.8 of this IRR and the applicable sections of Divisions 8 through 17 of this Chapter.

SECTION 10.2.4.2 CLASSIFICATION OF HAZARD OF CONTENTS

- A. The hazard of contents of any building or structure shall be classified as follows:

1. Low Hazard

Those of such low combustibility that no self-propagating fire therein can occur and that consequently, the only probable danger requiring the use of emergency exits will be from panic, fumes or smoke or fire from some external source.

2. Moderate Hazard

Those which are liable to burn with moderate rapidity or to give off a considerable volume of smoke but from which neither poisonous fumes nor explosions are to be expected in the event of fire.

3. High Hazard

Those which are liable to burn with extreme rapidity or from which poisonous gases or explosions are to be expected in the event of fire.

DIVISION 5. MEANS OF EGRESS

SECTION 10.2.5.1 APPLICATION

- A. Means of egress for both new and existing buildings shall comply with this Division except as may be modified for individual occupancies by Divisions 8 through 17 of this Chapter.
- B. Any change, alteration or addition that would reduce the means of egress below the requirements for new buildings is prohibited.

SECTION 10.2.5.2 GENERAL PROVISIONS

A. Permissible Exit Components

An exit shall consist of the approved components that are described, regulated, and limited as to use by Sections 10.2.5.3 through 10.2.5.12 of this IRR. Exit components shall be constructed as an integral part of the building or shall be permanently affixed thereto.

B. Protective Enclosure of Exits

1. When an exit is required to be protected by separation from other parts of the building by some requirements of this IRR, the construction of the separation shall meet the following requirements:
 - a. The separation shall have at least one (1) hour fire resistance rating when the exit connects three (3) storeys or less, regardless of whether the storeys connected are above or below the storey at which the exit discharge begins.
 - b. The separation shall have at least two (2) hours resistance rating when the exit connects four (4) or more storeys, whether above or below the floor of discharge. It shall be constructed of noncombustible materials and shall be supported by construction having at least a two (2)-hour fire resistance rating.
 - c. Any opening in the separation wall/construction shall be protected by an approved self-closing fire resistive door.
 - d. Openings in exit enclosure shall be confined to those necessary for access, to the enclosure from normally occupied spaces and for egress from the enclosure.
2. No exit enclosure shall be used for any purpose other than for means of egress.

C. Capacity of Means of Egress

1. The egress capacity for approved components of means of egress shall be based on the capacity factors shown in Table 1.

Table 1: CAPACITY FACTORS

Area	Stairways (width per person)		Level Components and Ramps (width per person)		Corridors and ramps
	mm	in	mm	in	
Board and Care	10	0.4	5	0.2	
Health Care, Sprinklered	7.6	0.3	5	0.2	
Health Care, Non Sprinklered	15	0.6	13	0.5	
High Hazards	18	0.7	10	0.4	
All Others	7.6	0.3	5	0.4	

2. The required capacity of a corridor shall be the occupant load that utilizes the corridor for exit access divided by the required number of exits to which the corridor connects, but the corridor capacity shall be not less than the required capacity of the exit to which the corridor leads.

D. Occupant Load

1. The total capacity of means of egress for any floor, balcony, tier, or other occupied space shall be sufficient for the occupant load thereof. The occupant load in any building or portion thereof shall be the maximum number of persons that may be in the space at any time, as determined by the City/Municipal Fire Marshal having jurisdiction, but shall not be less than the number computed by dividing the floor area assigned to that use by the occupant load factor in accordance with the requirements of Divisions 8 through 17 of this Chapter for individual occupancies
2. Where exits serve more than one floor, only the occupant load of each floor considered individually need be used in computing the capacity of the exits of that floor; Provided, that exit capacity shall not be decreased in the direction of exit travel. When means of egress from the floor above and below converge at an intermediate floor, the capacity of the means of egress from the point of convergence shall not be less than the sum of the two.
3. When any required egress capacity from a balcony or mezzanine passes through the room below, that required capacity shall be added to the required egress capacity of the room below.

E. Measurement of Means of Egress

1. The width of means of egress shall be measured by clear width starting from the narrowest point of the egress component under consideration, unless otherwise provided in para (2) hereof.
2. Projections of not more than one hundred fourteen millimeters (114 mm) at a maximum height of nine hundred sixty five millimeters (965 mm) within the means of egress on each side shall be permitted.

F. Minimum Width

The width of any means of egress shall not be less than nine hundred fifteen millimeters (915 mm) except when specifically provided under Division 8 to Division 17 of this Chapter.

G. Number of Means of Egress

1. The number of means of egress from any balcony, mezzanine, storey, or portion thereof shall not be less than two (2), except when specifically permitted in Division 8 through 17 of this Chapter.
2. When the occupant load for any storey or portion thereof is more than five hundred (500) but not more than one thousand (1000), the means of egress shall not be less than three (3); in excess thereof, the means of egress shall not be less than four (4).
3. The occupant load of each storey considered individually shall be required to be used in computing the number of means of egress at each storey, provided that the required number of means of egress is not decreased in the direction of exit travel.
4. No doors other than hoistway door, the elevator car door, and doors that are readily openable from the car side without a key, tool, special knowledge, or special effort shall be allowed at the point of access to an elevator car.
5. Elevator lobbies shall have access to at least one exit. Such exit access shall not require the use of a key, a tool, special knowledge, or special effort.

H. Arrangement of Exit

1. Exits shall be located and exit access shall be arranged so that exits are readily accessible at all times.
2. When exits are not immediately accessible from an open floor area, continuous passageways, aisles, or corridors leading directly to every exit shall be maintained and shall be arranged to provide access for

each occupant to not less than two exits by separate ways of travel.

3. Corridors shall provide exit access without passing through any intervening rooms other than corridors, lobbies, and other spaces permitted to be open to the corridor.
4. **Remoteness** shall be determined in accordance with the following:
 - a. When more than one exit is required from a building or portion thereof, such exits shall be remotely located from each other and shall be arranged and constructed to minimize the possibility that more than one exit has the potential to be blocked by any fire or other emergency condition.
 - b. When two (2) exits or exit access doors are required, they shall be located at a distance from one another not less than one-half (1/2) of the length of the maximum over-all diagonal dimension of the building or area to be served, measured in a straight line between the nearest edge of the exit doors or exit access doors, unless otherwise provided in para (c) hereof.
 - c. In buildings protected throughout by an approved supervised automatic sprinkler system, the minimum separation distance between two exits or exit access doors measured in accordance with para (b) hereof shall not be less than one-third (1/3) the length of the maximum overall diagonal dimension of the building or area to be served.
 - d. Where exit enclosures are provided as the required exits specified in para (b) and para (c) hereof and are interconnected by not less than 1-hour fire resistance-rated corridor, exit separation shall be measured along the line of travel within the corridor.
 - e. Where more than two exits or exit access doors are required, at least two (2) of the required exits or exit access doors shall be arranged to comply with the minimum separation distance requirement.
5. Interlocking or scissor stairs shall be considered only as a single exit for new buildings.

I. **Dead-End Limits**

Means of egress shall be so arranged that there are no dead-end pockets, hallways, corridors, passage ways or courts whose depth exceeds the limits specified in individual occupancies by Divisions 8 through 17 of this Chapter.

J. Measurement of Travel Distance to Exits

1. The maximum travel distance in any occupied space to the nearest exit shall not exceed the limits specified for individual occupancies by **Divisions 8 through 17** of this Chapter. Maximum travel distance shall be determined as follows:
 - a. The travel distance to an exit shall be measured on the floor or other walking surface along the center line of the natural path of travel, starting from the most remote point subject to occupancy, curving around any corner or construction with a thirty (30) centimeter clearance therefrom, and ending at the center of the doorway or other point at which the exit begins. Where measurement includes stairs, it shall be taken in the place of the tread nosing.
 - b. In the case of open areas, distance to exits shall be measured from the most remote point subject to occupancy. In case of individual **rooms subject to occupancy by not more than six (6) persons**, distance to exits shall be measured from the floors of such rooms provided the path of travel from any point in the room to the room door does not exceed fifteen meters (15 m).
2. Where open stairways or ramps are permitted, as a path of travel to required exit, such as between mezzanines or balconies and the floor below, the distance shall include the travel on the stairway or ramp, and the travel from the end of the stairway or ramp to reach an outside door or other exit, in addition to the distance to reach the stairway or ramp.
3. Where any part of an exterior way of exit access is within three meters (3 m) horizontal distance of any unprotected building opening, as permitted by Section 10.2.5.5 for outside stairs, the distance to the exit shall include the length of travel to ground level.

K. Access to Exits

1. A door from a room to an exit or to a way of exit access shall be of the side-hinged, swinging type. It shall swing with exit travel.
2. In no case shall access to exit be through a bathroom, bedroom, or other room subject to locking, except where the exit is required to serve only the bedroom or other room subject to locking, or adjoining rooms constituting part of the same dwelling or apartment used for single family occupancy.
3. Ways of exit access and the doors to exits to which they lead shall be designed and arranged to be clearly recognizable as such. Decorations or draperies shall not be placed on exit doors. Mirrors shall not

be placed in or adjacent to any exit in such a manner as to confuse the direction of exit.

4. Exit access shall be arranged that it will not be necessary to travel toward any area of high hazard occupancy in order to reach the nearest exit, unless the path is protected by suitable partitions.

L. Exterior Ways of Exit Access

1. Access to an exit may be by means of any exterior balcony, porch, gallery, or roof that conforms to the requirements of this Section.
2. Exterior ways of access shall have smooth, solid floors, substantially level, and shall have guards on the unenclosed sides at least equivalent to those specified in paragraph "H" of Section 10.2.5.4 of this IRR.
3. A permanent, reasonably straight path of travel shall be maintained over the required exterior way of exit access. There shall be no obstruction by railings, barriers, or gates that divide the open space into sections appurtenant to individual rooms, apartments, or other uses. Where the City/Municipal Fire Marshal having jurisdiction finds that the required path of travel is obstructed by furniture or other movable objects, he shall require their removal. However, if the width of the exterior way of exit access is greater than the required path of travel, he may permit the relocation of such furniture to one side so that they are out of the path's way. Such furniture shall then be fastened so they can no longer be moved. Alternatively, he may require that railings or other permanent barriers be installed to protect the path of travel against encroachment.
4. An exterior way of exit access shall be arranged so that there are no dead-ends in excess of six meters (6 m) in length.
5. Any gallery, balcony, bridge, porch or other exterior exit access that projects beyond the outside wall of a building shall comply with the requirements of this Division as to width and arrangement.

M. Discharge from Exits

1. All exits shall terminate directly at a public way or at an exit discharge. Yards, courts, open space, or other portions of the exit discharge shall be of required width and size to provide all occupants with a safe access to a public way.
2. Where permitted for individual occupancies by Divisions 8 through 17 of this Chapter, a maximum of fifty (50) percent of the exits may discharge through areas on the floor of discharge provided all of the following requirements are met:

- a. Exits shall discharge to a free and unobstructed way to the exterior of the building and is readily visible and identifiable from the point of discharge from the exit.
- b. The floor of discharge into which the exit discharges and any other portion of the level of discharge with access to the discharge areas are protected with approved, supervised sprinkler system or separated from it in accordance with the requirement for the enclosure of exits except if the discharge area is a vestibule or foyer complying with all of the following, and where allowed in Divisions 8 through 17:
 - i. The depth from the exterior of the building is not greater than three meters (3m);
 - ii. The length is not greater than six meters (6m);
 - iii. The foyer is separated from the remainder of the level of discharge by construction providing protection at least the equivalent of wired glass in steel frames; and the foyer serves only for means of egress including exits directly to the outside.
- c. The entire area on the floor of discharge is separated from areas below by construction having a minimum of two-hour (2-hr) fire resistance rating.

3. Stairs and other exits shall be so arranged as to make clear the direction of egress to the street. Exit stairs that continue beyond the floor of discharge shall be interrupted at the floor of discharge by partitions, doors, or other effective means.
4. Stairs, ramps, bridges, balconies, escalators, moving walks and other components of an exit discharge shall comply with the detailed requirements of this Division for such components.
5. Subject to the approval of the City/Municipal Fire Marshal having jurisdiction, exits may be accepted where discharging to roofs or other sections of the building or adjoining buildings, where the roof has a fire resistance rating at least the equivalent of that required for the exit enclosure, where there is a continuous and safe means of egress from the room, and all other reasonable requirements for the safety are maintained.

N. Headroom

The minimum headroom shall not be less than two meters (2 m) nor any projection from the ceiling be less than two meters (2 m) from the floor.

O. Changes in Elevation

Where a means of egress is not level, such differences in elevation shall be negotiated by stairs or ramps conforming to the requirements of this Section for stairs and ramps.

P. Interior Finish in Exits

The flame spread of interior finish shall not exceed Class B in accordance with Section 10.2.6.3 of this IRR in exit enclosures except when allowed in Division 8 through 17 of this Section.

SECTION 10.2.5.3 DOORS

A. Application

1. A door assembly, including the doorway, frame, door, and necessary hardware, may be used as a component in a means of egress when it conforms to the general requirements of Section 10.2.5.2 of this IRR and to the specific requirements of this Section.
2. Every door and every principal entrance which are required to serve as an exit shall be designed and constructed that the way of exit travel is obvious and direct. Windows, which because of their physical configuration or design and the materials used in their construction could be mistaken for doors, shall be made inaccessible to the occupants by barriers or railings conforming to the requirements of paragraph "H" of Section 10.2.5.4 of this IRR.
3. The door assembly required by this Section shall comply with the fire protection rating and, where rated, is self-closing or automatic-closing by means of smoke detection in accordance with Section 10.2.5.3 para "G" of this IRR, and is installed in accordance with NFPA 80, Standard for Fire Doors and Fire Windows.

B. Swing and Force to Open

1. Any door in a means of egress shall be of the side-hinged or pivoted-swinging type. The door shall be designed and installed so that it is capable of swinging from any position to the full required width of the opening in which it is installed. Doors required to be of the side-hinged or pivoted-swinging type shall swing in the direction of egress travel where serving a room or area with an occupant load of fifty (50) or more persons.
2. A door shall swing in the direction of egress travel when used in an exit enclosure or where serving a high hazard contents area, unless it is a door from an individual living unit that opens directly into an exit enclosure. During its swing, any door in a means of egress shall leave

not less than one-half of the required width of an aisle, corridor, passageway, or landing unobstructed and shall not project more than one hundred seventy eight millimeters (178 mm) into the required width of an aisle, corridor, passageway, or landing, when fully open. Doors shall not open directly onto a stair without a landing. The landing shall have a width not less than the width of the door.

3. Any door used in an exit and, unless exempt by other provisions of this Rule, shall be designed and installed that when a force is applied to the door on the side from which egress is to be made, it shall swing in the direction of exit travel from any position to the full instant use of the opening in which it is installed.

C. Locks, Latches, Alarm Devices

1. A door shall be arranged to be readily opened from the side from which egress is to be made at all times when the building served thereby is occupied. Locks, if provided, shall not require the use of a key, a tool, or special knowledge or effort, for operation from the inside of the building.
2. A latch or other fastening device on a door shall be provided with a knob, handle, panic bar, or other simple type releasing device, the method of operation of which is obvious, even in darkness.
3. A door designed to be kept normally closed in a means of egress, such as a door to a stair or horizontal exit, shall be provided with a reliable self-closing mechanism in accordance with para G of this Section, and shall not at any time be secured in the open position. A door designed to be kept normally closed shall bear a sign reading substantially as follows:

**FIRE EXIT
KEEP DOOR CLOSED**

4. Doors on buildings of four (4) or more storeys in height shall be provided with re-entry mechanism to provide access out of the stairway to another exit. There shall be re-entry mechanism every four (4) floors that provide a way out of the stairway.
5. Doors not allowing re-entry shall be provided with a sign indicating the location of the nearest door, in each direction of travel that allows re-entry or exit.

**NO RE - ENTRY
PROCEED TO _____ FLOOR
AND _____ FLOOR**

D. Egress Capacity Width

In determining the egress width for swinging doors, only the clear width of the doorway when the door is open ninety degrees (90°) shall be measured. In determining the egress width for other types of doors for purposes of calculating capacity, only the clear width of the doorway when the door is in the full open position shall be measured. Clear width of doorways shall be measured between the face of the door and the stop in accordance with Section 10.2.5.2 para "E" of this IRR.

E. Width and Floor Level

1. Door openings in means of egress shall not be less than seventy one centimeters (71 cm) in clear width. When a pair of doors is provided, not less than one of the doors shall provide at least seventy one centimeters (71 cm) clear width opening.
2. No single door in a doorway shall exceed one hundred twenty two centimeters (122 cm) in width.
3. The elevation of the floor surfaces on both sides of a door shall not vary by more than one and three-tenths centimeters (1.3 cm). The elevation shall be maintained on both sides of the doorway for a distance not less than the width of the widest leaf. Thresholds at doorways shall not exceed three-tenths centimeters (1.3 cm) in height. Raised thresholds and floor level changes in excess of six millimeters (6 mm) doorways shall be beveled with a slope not steeper than 1 in 2.

F. Panic Hardware

1. When a door is required to be equipped with panic hardware by some other provisions of this Rule, the panic hardware shall cause the door latch to release when a force of not more than seven kilogram force (7 kg-f) is applied to the releasing device in the direction of exit travel.
2. Such releasing devices shall be bars or panel extending not less than two-thirds (2/3) of the width of the door and placed at heights suitable for the service required, and shall not be less than seventy six (76) nor more than one hundred twelve centimeters(112 cm) above the floor.
3. Required panic hardware shall not be equipped with any locking or dogging device, set screw, or other arrangement which can be used to prevent the release of the latch when pressure is applied to the bar.

G. Self-Closing Devices

1. A door normally required to be kept closed shall be installed or equipped with automatic door closer in accordance with the following criteria:

- a. Upon release of the hold-open mechanism, the door becomes self-closing.
- b. The release device is designed so that the door instantly releases manually and, upon release, becomes self-closing, or the door can be readily closed.

H. Maintenance

No lock, padlock, hasp, bar, chain, or other device, or combination thereof shall be installed or maintained at any time on or in connection with any door on which panic hardware is required by this Chapter, if such device prevents, or is intended to prevent, the free use of the door for purposes of egress.

I. Power Operated Doors

1. Where required doors are operated by power, such as those with photo-electric actuated mechanism which open upon the approach of a person or doors with power-assisted manual operation, the design shall be such that in event of power failure, the door may be opened manually to permit exit travel or closed where necessary to safeguard means of egress.
2. No power-operated door shall be counted as a required exit unless it also swings with the exit travel by manual means.

J. Screen and Storm Doors

No screen door or storm door in connection with any required exit shall swing against the direction of exit travel in any case where doors are required to swing with the exit travel.

K. Revolving Doors

1. A revolving door shall not be used in a means of egress for an exit from the floor of discharge directly to the outside except where specifically permitted in other Divisions of this Chapter. It shall not be used at the foot or top of stairs at the floor of discharge. Where permitted, the revolving door or doors shall be given a credit of only fifty (50%) percent of the required capacity of exit except as provided in paragraph "K" (2) hereof. Such revolving doors shall be of approved type.
2. The number of revolving doors used as exit doors shall not exceed the number of swinging doors used as exit doors within six meters (6 m) except when revolving doors may serve as exits without adjacent swinging doors for street floor elevator lobbies, if no stairways or doors from other parts of the building discharge through the lobby, and the

lobby has no occupancy other than as a means of travel between elevators and street.

3. Revolving doors shall be equipped with means to prevent their rotation at too rapid a rate to permit orderly egress.

L. Turnstiles

1. No turnstiles or similar device to restrict travel to one direction, or to collect fares or admission charges, shall be placed to obstruct any required means of egress, except that approved turnstiles not over ninety one centimeters (91 cm), which turn freely in the direction of exit travel, may be used in any occupancy where revolving doors are permitted. Turnstiles over ninety one centimeters (91 cm) shall be subject to the requirements for revolving doors.
2. No turnstiles shall be placed in any required exit, or barring the way of access thereto or travel therefrom, unless immediately adjacent or within six and one-tenth meters (6.1 m) there is a swinging door or gate opening freely in the direction of exit travel, an open passage serving the same general path of travel as the turnstile.
3. Turnstile shall be rated the same as revolving doors as regards units of exit width and rates of travel.

M. Doors in Folding Partitions

1. When permanently mounted folding movable partition are used to divide a room into smaller spaces, a swinging door or open doorway shall be provided as a way of exit access from each such space.
2. The swinging door may be omitted and the partition may be used to enclose the space completely under the following conditions:
 - a. The subdivided space shall not be used by more than twenty (20) persons at any time;
 - b. The use of the space shall be under adult supervision;
 - c. The partitions shall be so arranged that they do not extend across any aisle or corridor used as a way of access to the required exits from the floor;
 - d. The partitions shall conform to the interior finish and other applicable requirements of this Chapter; and
 - e. The partitions shall be an approved type, shall have a simple method of release, and shall be capable of being opened quickly and easily by inexperienced persons in case of emergency.

N. Horizontal Sliding Doors

1. Horizontal sliding doors shall meet the following criteria:
 - a. The door is readily operable from either side without special knowledge or effort.
 - b. The force that, when applied to the operating device in the direction of egress, is required to operate the door is not more than seven kilogram force (7 kg-f).
 - c. The force required to operate the door in the direction of door travel is not more than fifteen kilogram force (15 kg-f) to set the door in motion and is not more than seven kilogram force (7 kg-f) to close the door or open it to the minimum required width.
 - d. The door assembly complies with the fire protection rating and, where rated, is self-closing or automatic-closing by means of smoke detection in accordance with Section 10.2.5.3 para G of this IRR, and is installed in accordance with NFPA 80, Standard for Fire Doors and Fire Windows.

SECTION 10.2.5.4 STAIRS

A. General

1. Stairs used as a component in the means of egress shall conform to the general requirements of Section 10.2.5.2 of this IRR and to the special requirements of this Section.
2. All stairways designated as a means of egress shall be continuous from the uppermost floor level down to ground floor.

B. Dimensional Criteria

1. Standard stairs shall meet the following criteria:
 - a. New stairs shall be in accordance with Table 2 and 4.
 - b. Existing stairs shall be permitted to remain in use, provided that they meet the requirements for existing stairs shown in Table 3.
 - c. Approved existing stairs shall be permitted to be rebuilt in accordance with the following:
 - i. Dimensional criteria of Table 3.
 - ii. Other stair requirements of Section 10.2.5.4 of this IRR.

d. The requirements for new and existing stairs shall not apply to stairs located in industrial equipment access areas except as otherwise provided in Division 15 of this Chapter.

Table 2: DIMENSIONAL CRITERIA FOR NEW STAIRS

Feature	Dimensional Criteria	
	mm	in
Minimum Width	See Table 4	
Maximum height of risers	180	7
Minimum height of risers	100	4
Minimum tread depth	280	11
Minimum headroom	2000	80
Maximum height between landings	3660	144

Table 3: DIMENSIONAL CRITERIA FOR EXISTING STAIRS

Feature	Dimensional Criteria	
	mm	in
Minimum width clear of all obstructions, except projections not more than 114 mm (4½ in) at or below handrail height on each side	915	36
Maximum height of risers	205	8
Minimum tread depth	230	9
Minimum headroom	2000	80
Maximum height between landings	3660	144

2. Minimum New Stair Width

- Where the total occupant load of all storeys served by the stair is fewer than 50, the minimum width clear of all obstructions, except projections not more than one hundred fourteen millimeters (114 mm) at or below handrail height on each side, shall be nine hundred fifteen millimeters (915 mm).
- Where stairs serve occupant loads exceeding that permitted by para B 2(a) of this Section, the minimum width clear of all obstructions, except projections not more than one hundred fourteen millimeters (114 mm) at or below handrail height on each side, shall be in accordance with Table 4 and the requirements of para B 2(c), (d), and (e) of this Section.

Table 4: NEW STAIR WIDTH

Total Cumulative Occupant Load Assigned to the Stair	Width	
	mm	in
<2000 persons	1120	44
≥2000 persons	1420	56

Read fine print!

WIDTH OF NEW STAIRS:

0-49: 915mm

50-1999: 1120mm

2000 or more: 1420mm

- c. The total cumulative occupant load assigned to a particular stair shall be that stair's prorated share of the total occupant load, as stipulated in (d) and (e), calculated in proportion to the stair width.
- d. For downward egress travel, stair width shall be based on the total number of occupants from storeys above the level where the width is measured.
- e. For upward egress travel, stair width shall be based on the total number of occupants from storeys below the level where the width is measured.

C. Curved Stairs

Curved stairs shall be permitted as a component in a means of egress, provided that the depth of tread is not less than two hundred eighty millimeters (280 mm) at a point three hundred five millimeters (305 mm) from the narrowest end of the tread and the smallest radius is not less than twice the stair width.

D. Spiral Stairs

1. Where specifically permitted for individual occupancies by Divisions 8 to 17 of this Chapter, spiral stairs as a component of means of egress shall comply with the following:
 - a. Riser heights shall not exceed one hundred eighty millimeters (180 mm).
 - b. The stairway shall have a tread depth of not less than two hundred eighty millimeters (280 mm) for a portion of stairway width sufficient to provide egress capacity for the occupant load served in accordance with Section 10.2.5.2 para C of this IRR.
 - c. At the outer side of the stairway, an additional two hundred sixty-five millimeters (265 mm) of width shall be provided clear to the other handrail, and this width shall not be included as part of the required egress capacity.
 - d. Handrails shall be provided on both sides of the spiral stairway.
 - e. The inner handrail shall be located within six hundred ten millimeters (610 mm), measured horizontally, of the point where a tread depth of not less than two hundred eighty millimeters (280 mm) is provided.
 - f. The turn of the stairway shall be such that the outer handrail is at the right side of descending users.

2. Where the occupant load served does not exceed three, spiral stairs shall be permitted, provided that the following criteria are met:
 - a. The clear width of the stairs shall be not less than six hundred sixty millimeters (660 mm).
 - b. The height of risers shall not exceed two hundred forty millimeters (240 mm).
 - c. The headroom shall be not less than one hundred ninety-eight centimeters (198 cm).
 - d. Treads shall have a depth of not less than one hundred ninety millimeters (190 mm) at a point three hundred five millimeters (305 mm) from the narrower edge.
 - e. All treads shall be identical.
 - f. Handrails shall be provided on both sides of the stairway.
3. Where the occupant load served does not exceed five, existing spiral stairs shall be permitted, provided that the requirements of para D 2(a) through (e) above are met.

E. Winders

Where allowed in Division 8 through Division 17 of this Chapter, winders shall be permitted in stairs, provided that the same shall have a tread depth of not less than one hundred fifty millimeters (150 mm) and a tread depth of not less than two hundred eighty millimeters (280 mm) at a point three hundred five millimeters (305 mm) from the narrowest edge.

F. Enclosure

1. All interior stairways shall be enclosed in accordance with the provisions of Section 10.2.5.2 and Section 10.2.6.2 of this IRR, except insofar as open stairways are permitted by paragraph "A" (2) of Section 10.2.6.2 of this IRR.
2. There shall be no enclosed, usable space within an exit enclosure, including under stairs, nor shall any open space within the enclosure be used for any purpose that has the potential to interfere with egress.

G. Stair Details

1. All stairs serving as required means of egress shall be of permanent fixed construction.

Each new stair and platform, landing, balcony and stair hallway floor

used in building of four (4) storeys or more and in all new buildings, required by this rule to be of fire-resistive construction, shall be non-combustible material throughout except that handrails are exempted from this requirement. Treads of stairs and landing floors shall be solid.

2. Each stair, platform, landing, balcony, and stair hallways floor shall be designed to carry a load of four hundred eighty-eight (488) kilos per square meter or a concentrated load of one hundred thirty six (136) kilos, so located as to produce maximum stress conditions.
3. There shall be no variation exceeding five millimeters (5mm), in the width of treads or in height of risers in any flight, except as permitted by paragraph H of this Section for monumental stairs.
4. Every tread less than twenty five centimeters (25 cm) shall have a nosing or an effective projection of approximately twenty five millimeters (25mm) over the level immediately below.
5. Where material of stair treads and landings is such as to involve danger of slipping, non-slip material shall be provided on tread surface.
6. Stairways and intermediate landings shall continue with no decrease in width along the direction of exit travel.

H. Guards and Handrails

1. Means of egress such as stairs, stair landings, balconies, ramps and aisles located along the edge of open-sided floor and mezzanines, shall have guards to prevent falls over the open side. Each new stair, stair landing, and ramp shall have handrails on both sides.
2. Required guards and handrails shall continue for the full length of each flight of stairs.
3. The design of guards and handrails and the hardware for attaching handrails to guards, balusters, or masonry walls shall be such that there are no projecting logs on attachment devices or non-projecting corners or members of grilles or panels which may engage loose clothing. Opening in guards shall be designed to prevent loose clothing from becoming wedged in such openings.

4. Handrails Details:

- a. Handrails on stairs shall be not less than seventy six centimeters (76 cm) nor more than eighty six and one-half centimeters (86.5 cm) above the upper surface of the tread, measured vertically to the top of the rail from a point on the tread twenty five millimeters (25 mm) back from the leading edge, except on stairways designed

for use by children an additional handrail may be provided lower than the main handrail.

- b. Handrails shall provide a clearance of at least thirty eight (38) millimeters between handrail and wall to which it is fastened. Handrails shall be of such design and so supported as to withstand a load of not less than ninety one kilos (91 kg) applied to any point, downward or horizontally.
- c. Handrails shall be so designed as to permit continuous sliding of hands on them.
- d. Every stairway required to be more than two hundred twenty three centimeters (223 cm) in width, shall have intermediate handrails dividing the stairway into portions not more than two hundred twenty three centimeters (223 cm) in width, except that on monumental outside stairs, two handrails may be permitted.

5. Guard Details:

- a. The height of guards required by paragraphs "H" of this Section shall be measured vertically to the top of the guard from a point on the tread twenty five millimeters (25mm) back from the leading edge or from the floor of landings or balconies.
- b. No guards shall be required for inside stairs which reverse direction at intermediate landings, where the horizontal distance between successive flights is not more than thirty and a half centimeters (30.5cm).
- c. Guards shall nor be less than one hundred six centimeters (106cm) high. Guards protecting changes in level one storey or less on interior balconies and mezzanines shall be not less than ninety one centimeters (91cm).
- d. Guards shall be so constructed that the area in the plane of the guard from the top of the floor, riser, or curb to the minimum required height of guard shall be subdivided or filled in one of the following manners:
 - i. A sufficient number of intermediate longitudinal rails so that the clear distance between rails measured at right angles to the run of rail do not exceed twenty five and a half centimeters (25.5 cm). The button rails shall not be more than twenty five and a half centimeters (25.5cm) from the top of the floor, tread or curb measured vertically.
 - ii. Vertical balusters spaced not more than fifteen and one-fourth centimeters (15.25 cm) apart.

- iii. Areas filled wholly or partially by panels of solid wire mesh or expanded metal construction or by ornamental grilles which provide protection against falling through the guard equivalent to that provided by the intermediate rails or vertical balusters specified in the two preceding paragraphs.
- iv. The lower part of the area may consist of a continuous substantial curb, the top of which is parallel to the run of stairs or level areas and the height of which is not less than seventy six millimeters (76mm) on stairs (measured at right angles to the curb from its top to the nosing of the tread) and not less than fifteen and one-fourth centimeters (15.25 cm) for level areas.
- v. Masonry walls may be used for any portion of the guard.
- vi. Any combination of the foregoing that provides equivalent safety.
- e. Enclosure walls and guards consisting of masonry, railings, or other construction shall either be designed for loads transmitted by attached handrails or shall be designed to resist a horizontal force of seventy five kilograms (75 kg) per lineal meter applied at the top of the guard, whichever condition produces maximum stress. For walls or guards higher than the minimum height, the specified force shall be applied at a height one hundred seven centimeters (107 cm) above the floor or tread.
- f. Intermediate rails, balusters, and panel fillers shall be designed for a uniform load of not less than one hundred twenty two kilograms (122 kg) per square meter over the gross area of the guard (including the area of any opening in the guard) of which they are a part. Reactions due to this loading need not be added to the loading specified by para H 5(c) of Guard Details in designing the main supporting members of guards.

I. Smokeproof Enclosures

1. General

Where smokeproof enclosures are required in other sections of this code, they shall comply with this Section, except for approved existing smokeproof enclosures.

2. Performance Design

An appropriate design method shall be used to provide a system that meets the definition of smokeproof enclosure. The smokeproof enclosure shall be permitted to be created by using natural ventilation, by using mechanical ventilation incorporating a vestibule, or by pressurizing the stair enclosure.

3. Enclosure

A smokeproof enclosure shall be enclosed from the highest point to the lowest point by barriers having 2-hour fire resistance ratings. Where a vestibule is used, it shall be within the 2-hour-rated enclosure and shall be considered part of the smokeproof enclosure.

4. Vestibule

Where a vestibule is provided, the doorway into the vestibule shall be protected with an approved fire door assembly having a 1½-hour fire resistance rating, and the fire door assembly from the vestibule to the smokeproof enclosure shall have not less than a 20-minute fire resistance rating. Doors shall be designed to minimize air leakage and shall be self-closing or shall be automatic-closing by actuation of a smoke detector within three meters (3 m) of the vestibule door. New doors shall be installed in accordance with NFPA 105, *Standard for the Installation of Smoke Door Assemblies*.

5. Discharge

Every smokeproof enclosure shall discharge into a public way, into a yard or court having direct access to a public way, or into an exit passageway. Such exit passageways shall be without openings, other than the entrance to the smokeproof enclosure and the door to the outside yard, court or public way. The exit passageway shall be separated from the remainder of the building by a 2-hour fire resistance rating.

6. Access

For smokeproof enclosures other than those consisting of a pressurized stair enclosure complying with para (9) hereof, access to the smokeproof enclosure stair shall be by way of a vestibule or by way of an exterior balcony.

7. Natural Ventilation

Smokeproof enclosures using natural ventilation shall comply with para (3) hereof and the following:

- a. Where access to the stair is by means of an open exterior balcony, the door assembly to the stair shall have a 1½-hour fire resistance rating and shall be self-closing or shall be automatic-closing by actuation of a smoke detector. Openings adjacent to the exterior balcony specified in the preceding paragraph shall be protected
- b. Every vestibule shall have a net area of not less than one and a half (1.5 m²) of opening in an exterior wall facing an exterior court, yard, or public space not less than six meters (6 m) in width.

- c. Every vestibule shall have a minimum dimension of not less than the required width of the corridor leading to it and a dimension of not less than one hundred eighty three centimeters (183 cm) in the direction of travel.

8. Mechanical Ventilation

Smokeproof enclosures using mechanical ventilation shall comply with the following requirements:

- a. Vestibules shall have a dimension of not less than one hundred twelve centimeters (112 cm) in width and not less than one hundred eighty three centimeters (183 cm) in direction of travel.
- b. The vestibule shall be provided with not less than one air change per minute, and the exhaust shall be 150 percent of the supply. Supply air shall enter and exhaust air shall discharge from the vestibule through separate tightly constructed ducts used only for such purposes. Supply air shall enter the vestibule within one hundred fifty millimeters (150 mm) of the floor level. The top of the exhaust register shall be located not more than one hundred fifty millimeters (150 mm) below the top of the trap and shall be entirely within the smoke trap area. Doors, when in the open position, shall not obstruct duct openings. Controlling dampers shall be permitted in duct openings if needed to meet the design requirements.
- c. To serve as a smoke and heat trap and to provide an upward-moving air column, the vestibule ceiling shall be not less than five hundred ten millimeters (510 mm) higher than the door opening into the vestibule. The height shall be permitted to be decreased where justified by engineering design and field testing.
- d. The stair shall be provided with a dampered relief opening at the top and supplied mechanically with sufficient air to discharge at least 70.8 m³/min through the relief opening while maintaining a positive pressure of not less than 25 N/m² in the stair, relative to the vestibule with all doors closed.

9. Stair Pressurization

- a. Smokeproof enclosures using stair pressurization shall use an approved engineered system with a design pressure difference across the barrier of not less than 12.5 N/m² in sprinklered buildings, or 25 N/m² in nonsprinklered buildings, and shall be capable of maintaining these pressure differences under likely conditions of stack effect or wind. The pressure difference across doors shall not exceed that which allows the door to begin to be

opened by a force of 133 N in accordance with Section 10.2.5.3 of this IRR.

- b. Equipment and ductwork for stair pressurization shall be located in accordance with one of the following specifications:
 - i. Exterior to the building and directly connected to the stairway by ductwork enclosed in noncombustible construction
 - ii. Within the stair enclosure with intake and exhaust air vented directly to the outside or through ductwork enclosed by a 2-hour fire-resistive rating
- III. Within the building under the following conditions:
 - iii.a. Where the equipment and ductwork are separated from the remainder of the building, including other mechanical equipment, by a 2-hour fire-resistive rating.
 - iii.b. Where the building, including the stairway enclosure, is protected throughout by an approved, supervised automatic sprinkler system and the equipment and ductwork are separated from the remainder of the building, including other mechanical equipment, by not less than a 1-hour fire-resistive rating
- c. In all cases specified by para "I" 9(a) through (b) of this Section, openings into the required fire resistance-rated construction shall be limited to those needed for maintenance and operation and shall be protected by self-closing fire protection-rated devices.

10. Activation of Mechanical Ventilation and Pressurized Stair Systems

- a. For both mechanical ventilation and pressurized stair enclosure systems, the activation of the systems shall be initiated by a smoke detector installed in an approved location within three meters (3 m) of the entrance to the smokeproof enclosure.
- b. The required mechanical system shall operate upon the activation of the smoke detectors specified in para "I" 10(a) above and by manual controls accessible to the fire department. The required system also shall be initiated by the following, if provided:
 - i. Water flow signal from a complete automatic sprinkler system; or
 - ii. General evacuation alarm signal.

11. Door Closers

The activation of an automatic-closing device on any door in the smokeproof enclosure shall activate all other automatic-closing devices on doors in the smokeproof enclosure.

12. Emergency Power Supply System (EPSS)

EPSS for new mechanical ventilation equipment shall be provided in accordance with NFPA 110, *Standard for Emergency and Standby Power Systems*.

J. Monumental Stairs

Monumental stairs, either inside or outside, may be accepted as required exits if all requirements for exit stairs are complied with, including required enclosures and minimum width of treads, except that curved stairs may be accepted with a radius of seven and one-half meters (7.5 m) or more at the inner edges.

SECTION 10.2.5.5 OUTSIDE STAIRS

A. General

Any permanently installed stair outside of the building being served is acceptable as a means of egress under the same condition.

B. Enclosures

1. Under all conditions where enclosure of inside stairways is required, outside stairs shall be separated from the interior of the buildings with walls having the same fire-resistance rating as that required for the wall enclosing inside stairs. Any opening in such wall shall be protected by fire doors or fixed wired glass windows.
2. Wall construction required by para "B" (1) of this Section shall extend as follows:
 - a. Either vertically from the ground to a point 3,050 mm above the topmost landing of the stairs or to the roofline, whichever is lower.
 - b. Horizontally for not less than 3050 mm.

SECTION 10.2.5.6 HORIZONTAL EXITS

A. Application

1. A horizontal exit is a way of passage from one building to an area of refuge in another building on approximately the same level, or a way

of passage through or around a wall or partition to an area of refuge on approximately the same level in the same building, which affords safety from fire or smoke from the area of escape and areas communicating therewith.

2. Horizontal exits may be substituted for other exits to an extent that the total exit capacity of the other exits (stairs, ramps, doors leading outside the building) will not be reduced below half that required for the entire area of the building or connected building if there were no horizontal exits, except for health care occupancies, the total exit capacity of the other exits (stairs, ramps, doors leading outside the building) shall not be reduced below one-third (1/3) that required for the entire area of the building.

B. Egress from Area of Refuge

1. Every fire section allowed in connection with a horizontal exit shall have in addition to the horizontal exit or exits at least one stairway, doorway leading outside or other standard exit. Any fire section not having a stairway or doorway leading outside shall be considered as part of an adjoining section with stairway.
2. Every horizontal exit shall be arranged that there are continuously available paths of travel leading from each side of the exit to stairways or other standard means of egress leading to outside the building.

This requirement is complied with where the entire areas from each side of the horizontal exit to the stairways or other standard means of egress are occupied by the same tenant; or where there are public corridors or other continuously available passageways leading from each side of the exit to stairway or other standard means of egress leading to outside of the building.

3. Whenever either side of the horizontal exit is occupied, doors used in connection with the horizontal exit shall swing in opposite directions and shall not be locked from either side.
4. The floor area on either side of a horizontal exit shall be sufficient to hold the occupant of both floor areas, allowing not less than three-tenths square meter (0.3 m^2) clear floor areas per person.
5. Every building shall be provided with separate means of egress. in cases where means of egress is by means of horizontal exit to another building or structure, the exits of said building shall be maintained, properly protected and readily accessible to the occupants of the other building

C. Bridges and Balconies

1. Each bridge or balcony utilized in conjunction with horizontal exits shall comply with the structural requirements for outside stairs and shall have guards and handrails in general conformity with the requirements of Section 10.2.5.4 of this IRR for stairs and smokeproof enclosures.
2. Every bridge or balcony shall be at least as wide as the door leading to it and not less than one hundred twelve centimeters (112 cm) for new construction.
3. Every door leading to a bridge or balcony serving as a horizontal exit from a fire area, shall swing with exit travel out of the fire area.
4. Where the bridge or balcony serves as a horizontal exit in one direction, only the door from the bridge or balcony into the area of refuge shall swing in.
5. Where the bridge or balcony serve as a horizontal exit in both directions, doors shall be provided in pairs swinging in opposite directions, only the door swinging with the exit travel to be counted in determination of exit width, unless the bridge or balcony has sufficient floor area to accommodate the occupant load of either connected or fire area on the basis of three-tenths square meter (0.3 m^2) per person or in existing buildings by specific permission of the City/Municipal Fire Marshal having jurisdiction, in which case doors on both ends of the bridge or balcony may swing out from the buildings.
6. The bridge or balcony floor shall be level with the floor of the building.
7. Ramps shall be employed where there is a difference in level between connected buildings or floor areas. Steps may be used where the difference in elevation is greater than fifty three and one-third centimeters (53.34 cm). Ramps and stairs shall be in accordance with the sections of this Rule pertaining to ramps, stairs and outside stairs.
8. All wall openings, in both of the connected buildings or fire areas any part of which is within three meters (3 m) of any bridge or balcony as measured horizontally or below, shall be protected with fire doors or fixed metal-frame wired-glass windows, except where bridges have solid sides not less than one and eight-tenths meters (1.8 m) in height, such protection of wall openings may be omitted.

D. Openings through Walls for Horizontal Exits

1. Walls connected by a horizontal exit between buildings shall be of non-combustible material having a two (2) hour fire resistance rating. They shall provide a separation continuous to the ground.

2. Any opening in such walls, whether or not such opening serves as an exit, shall be adequately protected against the passage of fire or smoke there from.
3. Swinging fire exit doors on horizontal exits shall swing with the exit travel. Where a horizontal exit serves on both sides of a wall there shall be adjacent openings with swinging doors at each wall, opening in opposite directions, with signs on each side of the wall or partitions indicating as the exit door which swings with the travel from that side, or other approved arrangements providing doors always swinging with any possible exit travel.
4. Sliding fire doors shall not be used on a horizontal exit except where the doorway is protected by a fire door on each side of the wall in which such sliding fire doors are located. In this case, one fire door shall be of the swinging type as provided in paragraph "C" (3) of this Section and the other may be an automatic sliding fire door that shall be kept open whenever the building is occupied.

E. Omission of Fire Partition on Certain Floors

1. Where a fire partition is used to provide a horizontal exit in any storey of a building, such partition may be omitted in any lower storey under the following conditions:
 - a. The open fire area storey from which the fire partition is omitted shall be separated from the storeys above by construction having at least a 2-hour resistance rating.
 - b. Required exits from the storeys above the open fire area storey shall be separated there from by construction having a 2-hour fire resistance rating and shall discharge outside without travel through the open fire area storey.
 - c. Vertical openings between the open fire area storey and the storeys above shall be enclosed with construction having a 2-hour fire resistance rating. Other details shall be in accordance with the applicable provisions of Section 10.2.5.2 of this IRR.
2. Where a fire partition is used to provide a horizontal exit for any storey below the discharge level, such partition may be omitted at the level of the discharge under the following conditions:
 - a. The open fire area storey shall be separated from the storeys below by construction having at least a 2-hour fire resistance rating.
 - b. Required exits from storeys below the open fire area storey shall be separated from the open fire area storey by construction having a

2-hour fire resistance rating and all discharge directly outside without travel through the open fire area storey.

- c. Vertical openings between the open fire area storey and the floors below shall be enclosed with the construction having a 2-hour fire resistance rating. Other details shall be in accordance with the applicable provisions of Section 10.2.5.2 of this IRR.

SECTION 10.2.5.7 RAMPS

A. Application

A ramp shall be permitted as component in a means of egress when it conforms to the general requirements of Section 10.2.5.2 of this IRR and to the special requirements of this Section.

B. Dimensional Criteria

The following dimensional criteria shall apply to ramps:

Table 5: DIMENSIONAL CRITERIA FOR NEW RAMPS

Feature	Dimensional Criteria	
	mm	in
Minimum width clear of all obstructions, except projections not more than 4½ in. (114 mm) at or below handrail height on each side	1120	44
Maximum slope	1 in 12	
Maximum cross slope	1 in 48	
Maximum rise for a single ramp run	760	30

C. Protective Enclosure

1. When a ramp inside a building is used as an exit or exit component, it shall be protected by separation from other parts of the building as specified in Section 10.2.5.2 "B" of this IRR.
2. Fixed wired glass panels in steel sash may be installed in such a separation in a building fully provided with approved, supervised sprinkler system.
3. There shall be no enclosed usable space under ramps in an exit enclosure nor shall the open space under such ramps be used for any purpose.

D. Other Details

1. A ramp and the platforms and landings associated therewith shall be

designed for not less than four hundred eighty eight kilos per square meter (488 kg/m^2) live load and shall have a nonslip surface.

2. The slope of a ramp shall not vary between landings. Landings shall be level and changes in direction of travel if any shall be made only at landings.
3. A ramp used as an exit component in a building more than three (3) storeys, or in a building of any height of noncombustible or fire-resistive construction, shall be of noncombustible material. The ramp floor and landings shall be solid and without perforations.
4. Guards and handrails complying with Section 10.2.5.4 "H" of this IRR shall be provided in comparable situations for ramps except that handrails are not required on Class A ramps.

E. Special Provisions for Outside Ramps

1. Outside ramps shall be arranged to avoid any impediments to their use. For ramps more than three storeys in height, any arrangement intended to meet this requirement shall be at least one hundred twenty two centimeters (122 cm) in height.
2. Outside ramps and landings shall be designed and maintained to minimize water accumulation on their surfaces.

SECTION 10.2.5.8 EXIT PASSAGEWAYS

A. Application

Any hallway, corridor, passage or tunnel, may be designated as an exit, passageway and used as an exit or component when conforming to all applicable requirement of Section 10.2.5.2 of this IRR as modified by the provisions of this Section.

B. Protective Enclosure and Arrangement

1. An exit passageway shall be protected by separation from other parts of the building as specified in paragraph "B" of Section 10.2.5.2 of this IRR.
2. Fixed wired glass panels in steel sash may be installed in such a separation in building provided with automatic fire suppression system.

C. Width

The width of an exit passageway shall be adequate to accommodate the aggregate capacity of all exits discharging through it.

D. Floor

The floor shall be solid and without perforations.

SECTION 10.2.5.9 ESCALATORS AND MOVING WALKS

Escalators and moving walks shall not constitute a part of the required means of egress, unless they are previously approved existing escalators and moving walks.

SECTION 10.2.5.10 FIRE ESCAPE STAIRS, LADDERS AND SLIDE ESCAPES

A. Fire Escape Stairs

1. General

- a. Fire escape stairs (not those under Section 10.2.5.4 and 10.2.5.5 of this IRR) may be used in required means of egress only in existing buildings, subject to the applicable provisions of Divisions 8 through 17 of this Chapter. Fire escape stairs shall not constitute more than (50%) percent of the required exit capacity in any case. Fire escape stairs shall not be accepted as constituting any part of the required means of egress for new buildings.
- b. Fire escape shall provide a continuous unobstructed safe path of travel to the ground or other safe area of refuge to which they lead. Where the fire escape is not continuous, as in cases where stairs lead to an adjoining roof, which must be clearly indicated, and suitable walkways with handrails shall be provided where necessary. Where a single means of egress consists of a combination of inside stairs and fire escape stairs, each shall comply with the applicable provision of this Chapter, and the two shall be so arranged and connected as to provide a continuous safe path of travel.

2. Types

- a. The following types of fire escape stairs are recognized by this Chapter:
 - i. Return platform types with superimposed runs; or
 - ii. Straight run type, with platforms continuing in the same direction.
- b. Either of these may be parallel to or at right angle to the building. They may be attached to buildings or erected independently of them and connected bridges.

3. Stairs Details

Fire escape stairs, depending upon the requirement of Division 8 through 17 of this Chapter, shall be in accordance with the following table and subsequent paragraphs.

Table 6: DIMENSIONAL CRITERIA FOR FIRE ESCAPE STAIRS

PARTICULARS	DIMENSIONS
Minimum widths	60 cm clear between rails
Minimum horizontal dimension any landing or platform	60 cm
Maximum rise	23 cm
Minimum tread, exclusive of nosing	23 cm
Tread construction	Solid, 13 mm diameter perforation permitted
Winders (spiral)	None
Risers	None
Maximum height between landings	3.66 m
Headroom, minimum	2.00 m
Access to escape	Door or casement windows 61 cm by 1.98 m or double hung windows 76.20 cm by 91.44 cm clear
Level of access opening	Not over 30.50 cm above floor; steps if higher
Discharge to ground	Swinging stair section permitted
Capacity number of persons	45 per unit* access by door; 20 if access by climbing over window rail

4. Arrangement and Protection of Openings

Fire escape stairs shall be so arranged that they will be exposed by the smallest possible or window and door openings. There shall be no transom over doors. Every opening, any portion of which is in the limits specified below, shall be completely protected by approved fire doors or metal-frame wired glass windows in the same manner as provided for outside stairs and outside ramps.

5. Access

- a. Access to fire escape stairs shall be provided in accordance with the table in para "A" (3) of this Section and the general provisions of paragraph "K" Section 10.2.5.2 of this IRR.
- b. Where access is by way of double windows, such windows shall be

so counterbalanced and maintained that they can be readily opened with a minimum of physical effort. Insert screens, if any, on any type of opening giving access to fire, an escape stair shall be of types that may be readily opened or pushed out. No storm sash shall be used on any window providing to fire escape stairs.

- c. Fire escape stairs shall extend to the roof in all cases where the roof is subject to occupancy or is constructed and arranged to provide an area of refuge from fire. In all cases where stairs do not extend to the roof, access thereto shall be provided by a ladder in accordance with pertinent provision of Section 10.2.5.10 of this IRR on Fire Escape Ladder, except that such ladders are not required in the case of roofs with pitch or slope steeper than sixteen and two-thirds (16.67%) percent.
- d. Balconies, to which access is secured through windows with sills above the inside floor level, shall be not more than forty six centimeters (46 cm) below the sill. In no case shall balcony level be above the sill.

6. Materials and Strength

- a. Iron, steel, or reinforced or concrete or other approved noncombustible material shall be used for the construction of fire stairs, balconies, railings, and other features appurtenant thereto.
- b. Balconies and stairs shall be designed to carry a load of four hundred eighty eight (488) kilos per square meter or a concentrated load of one hundred thirty six (136) kilos so located as to produce maximum stress conditions.
- c. Except where embedded in masonry or concrete or where a suitable fire resistive and waterproof covering is provided no structural metal member shall be employed the entire surface of which is not capable of being inspected and painted.
- d. All supporting members for balconies and stairs, which are in tension and are fastened directly to the building, shall pass through the wall and be securely fastened on the opposite side or they shall be securely fastened to the framework of the building. Where metal members pass through walls, they shall be protected effectively against corrosion. Holes in the wall through which metal member pass shall be effectively fire-stopped to preserve the fire resistive quality of the wall.
- e. Balcony and stair enclosure and railings shall be designed to withstand a horizontal force of seventy five (75) kilos per meter of railing or enclosure without serious deflection, and support at walls

for such railings or enclosures shall be in the manner specified in (6)(b) for tension members, except as provided in para "A"(6)(f) of this Section.

- f. Notwithstanding the provisions of para "A" (6)(b) and (6)(c) of this Section, the City/Municipal Fire Marshal having jurisdiction may approve any existing fire escape stair for a very small building when it has been shown by load test or other evidence a satisfactory to him to have adequate strength.

7. Guards and Handrails

- a. All fire escape shall have walls or guards on both sides, in accordance with para "H" of Section 10.2.5.4 of this IRR, except for height, which shall be one hundred seven centimeters (107 cm) and ninety one centimeters (91 cm) for fire escape for every small buildings, the height being measured vertically from a point on the stair tread twenty five millimeters (25 mm) back from the leading edge, or vertically above any landings or balcony floor level.
- b. All fire escape shall have handrails on both sides, not less than seventy six centimeters (76 cm) not more than one hundred seven centimeters (107 cm) high, measured vertically from a point on the stair tread twenty five millimeters (25mm) back from the leading edge, all in general conformity to the requirements for stair handrails, para "H" of Section 10.2.5.4 of this IRR.
- c. Handrails and guards shall be so constructed as to withstand a force of ninety one kilograms (91 kg) applied downward or horizontally at any point.

8. Swinging Section of Fire Escape Stairs

- a. Swinging stair sections shall not be used for fire escape stairs except where termination over sidewalks, alleys or driveways makes it impracticable to build stairs permanently to the ground. Where used, swinging stairs shall comply with all provisions of this subsection.
- b. Swinging section of stairs shall not be located over doors, over the path of travel from any other exit, or in any location where there are or likely to be obstruction.
- c. Width of swinging section of stairs shall be at least equal to that of the stairs above.
- d. Pitch/slope shall not be steeper than that of the stairs above.
- e. Railings shall be provided similar in height and construction to those required for the stairs above. Railings shall be designed to

prevent any possibility of injury to persons at head or stairs or on balconies when stairs swing downward. Minimum clearance between moving sections where hands might be caught shall be ten centimeters (10 cm).

- f. If distance from lowest platform to ground exceed three and two-thirds meters (3.67 m), an intermediate balcony not more than three and two-thirds meters (3.67 m) from the ground or less than two meters (2 m) in the clear underneath shall be provided with width not less than that of the stairs and length not less than one and two tenths meters (1.2 m).
- g. Counterweight shall be provided for swinging stairs and this shall be of type balancing about a pivot, no cables being used. Counterweight shall be securely bolted in place, but sliding ball weights or their equivalent may be used to hold stairs up and help lower them. Counterbalancing shall be such that a person weighing sixty eight kilos (68 kg), who makes one step from the pivot, will not start swinging the section downward, but when he is one quarter of the length of the swinging stairs from the pivot, the section will swing down.
- h. Pivot for swinging stairs shall either have a bronze bushing or have sufficient to prevent sucking on account on corrosion.
- i. No latch to lock swinging stairs section in up position shall be installed.

B. Fire Escape Ladders

1. Application

No form of ladder shall be used as a fire escape under the provisions of this Chapter, except that ladders conforming to the following specifications may be used to provide access to unoccupied roof spaces to provide a means of escape from boiler rooms, grain elevators and towers as permitted by Division 16 and 17 of this Chapter, elevated platforms around machinery or similar spaces subject to occupancy by not more than three able-bodied adults and in single and two family dwellings and residential apartments of not more than three (3) storey provided that the height shall not exceed nine meters (9 m). For purposes of this subsection, mezzanine floors shall be counted as ordinary floor.

2. Installation

- a. All ladders shall be permanently installed in fixed position, supported by rigid connection to the building or structure at intervals not exceeding three meters (3 m).

- b. Where ladders provide access to roofs or elevated platforms, rails shall extend not less than one hundred fourteen centimeters (114 cm) above roofline or platform floor or above coping or parapet, Extension of side rails to roof shall be carried over coping or parapet to afford hand hold.
- c. Ladders shall be arranged parallel to buildings or structures with travel either between ladder and buildings, in which case minimum clearance center of rungs and buildings shall be sixty eight centimeters (68 cm), or outside of ladder, in which case minimum clearance between center of rungs and buildings shall be sixteen centimeters (16 cm).
- d. Ladders shall be vertical or positively inclined. No negatively inclined ladders (i.e., ladder sloping out over the head of a person using it) shall be permitted.

3. Construction

- a. Ladders shall be constructed of iron, of steel or of other metal in design having equivalent strength and resistance to corrosion.
- b. Rails of iron or steel ladders shall not less than one and one-fourth centimeters (1.25 cm) by five centimeters (5 cm) in section, not less than forty centimeters (40 cm) apart.
- c. Rungs shall not less than twenty two millimeters (22 mm) diameter and shall be riveted or welded in position not less than twenty five centimeters (25 cm) nor more than thirty and one-half centimeters (30.5 cm) on center.
- d. The lowest rung of any ladder shall be not more than thirty and one half centimeters (30.5 cm) above the level of the ground or balcony floor beneath it.

C. Slide Escape

1. Use and Capacity Rating

- a. A slide escape may be used as component in means of egress where specifically authorized by Divisions 8 through 17 of this Chapter.
- b. Slide escapes, where permitted as required exits, shall be rated at one exit unit per slide, with rated travel capacity of 60 persons per minute.
- c. Slide escapes, except as permitted for high hazard manufacturing buildings or structures, shall not constitute more than twenty five

(25%) percent of the required number of units of exit width from any building or structure or any individual storey or floor thereof.

- d. Slide escapes, used as exits shall comply with the applicable requirements of this Division for other types of exits.

SECTION 10.2.5.11 ILLUMINATION OF MEANS OF EGRESS

A. General

1. Illumination of means of egress shall be provided for every building and structure in accordance with this Section, as required by Divisions 8 through 17 of this Chapter.
2. Illumination of means of egress shall be continuous during the time that the conditions of occupancy require that the means of egress be available for use. Artificial lighting shall be employed at such places and for such periods of time as required to maintain the illumination to the minimum lumen values herein specified.
3. The floors of means of egress shall be illuminated at all points including angles and intersections of corridors and passageways, landings of stairs, and exit doors to values of not less than 10.7 lux.
4. Any required illumination shall be so arranged that the failure of any lighting unit, such as the burning out of an electric bulb, will not leave any area in darkness.

B. Sources of Illumination

1. Illumination of means of egress shall be from a source of reasonably assured reliability, such as public utility electric service.
2. Where electricity is used as a source of illumination of means of egress, the installation shall be properly made in accordance with the appropriate and internationally accepted standards.
3. No battery operated electric light nor any type of portable lamp or lantern shall be used for primary illumination of means of egress; but may be used as an emergency source to the extent permitted under Emergency Lighting, paragraph "C" of this Section.
4. No luminescent, fluorescent, or reflective material shall be permitted as substitutes for any of the required illumination herein specified.

C. Emergency Lighting

1. In occupancies specified in Division 8 through 17 of this Chapter, emergency lighting, facilities shall be provided for means of egress.

Where maintenance of illumination depends upon charging from one energy source to another, there shall be no appreciable interruption of illumination during the changeover. Where emergency lighting is provided by a prime mover-operated electric generator, a delay of not more than ten (10) seconds shall be permitted.

2. Emergency lighting facilities shall be arranged to maintain the specified degree of illumination in the event of failure of the normal lighting for a period of at least one and one half (1 ½) hour.
3. An emergency lighting system shall be provided as specified in Divisions 8 through 17, subject to the approval of the City/Municipal Fire Marshal having jurisdiction as to the suitability of the equipment for its intended use and the conditions in the individual premises.
4. Electric battery-operated emergency lights shall use only reliable types of storage batteries, provided with suitable facilities for maintenance in properly charged condition. Dry batteries shall not be used to satisfy these requirements. Electric storage batteries used in such lights or units shall be approved for their intended use and shall comply with Philippine National Standard (PNS) or other internationally accepted standards.
5. An emergency lighting system shall be so arranged as to provide the required illumination automatically in the event of any interruption of normal lighting, such as any failure of public utility or other outside electrical power supply, opening of a circuit breaker or fuse, or any manual act, including accidental opening of a switch controlling normal lighting facilities.
6. An emergency lighting system shall either be continuously in operation or shall be capable of repeated automatic operation without intervention.
7. All emergency lighting systems installed in accordance with this section shall be properly maintained. Maintenance program shall be documented and incorporated in FALAR 3.

SECTION 10.2.5.12 EXIT MARKING

A. Signs

1. Where required by the provisions of Division 8 through Division 17 of this Chapter exits shall be marked by a readily visible sign. Access to exit shall be marked by readily visible signs in all cases where the exit or way to reach it is not immediately visible to the occupants and in any case where required by the applicable provisions of Divisions 8 through 17 of this Chapter for individual occupancies.

2. Any door, passage, or stairway, which is neither an exit nor a way of exit access and which is so located or arranged as likely to be mistaken for an exit, shall be identified by a sign reading "**NOT AN EXIT**" and shall be identified by a sign indicating its actual character, such as "**TO BASEMENT**", "**STOREROOM**", "**LINEN CLOSET**", or the like.
3. Every required sign designating an exit or way of exit access shall be so located and of such size, color, and design as to be readily visible. No decorations, furnishing, or equipment which impair visibility of an exit sign shall be permitted, nor shall there be any brightly illuminated sign (for other than exit purposes), display, or object in or near the line of vision to the required exit sign of such a character as to distract attention from the exit sign.
4. A sign reading "**EXIT**" with an arrow indicating the direction shall be placed in every location where the direction of travel to reach the nearest exit is not immediately apparent.
5. Every sign shall be distinctive in color and shall provide contrast with decorative interior finish, or other signs.

B. Illumination of Signs

1. Every sign shall be suitably illuminated by a reliable light source giving a value of not less than five thousandth (0.005) lumens per square centimeters on the illuminated surface. Such illumination shall be continuous as required under the provisions of Section 10.2.5.11 of this IRR (Illumination of Means of Egress), and where emergency lighting facilities are required, exit signs shall be illuminated from the same source.
2. Internally illuminated signs shall be provided in all occupancies where reduction of normal illumination is permitted, such as in motion picture theaters.
3. Luminous directional signs shall comply with para "C" hereof.

C. Size of Signs

Every exit shall have the word "**EXIT**" in plainly legible letters not less than fifteen centimeters (15 cm) high with the principal strokes of letters not less than nineteen millimeters (19 mm) wide, except that in existing building externally illuminated exit signs therein having the word "**EXIT**" in plainly visible letters not less than eleven and one half centimeters (11.5 cm) high, other than in places of assembly, may be continued in use. Other signages required by this rule shall be of the same dimension unless otherwise provided.

SECTION 10.2.5.13 EMERGENCY EVACUATION PLAN

An emergency evacuation plan shall be posted on strategic and conspicuous locations in the building. This shall be drawn with a photoluminescent background to be readable in case of power failure. The minimum dimension shall be 8 ½ inches in height and 11 inches in width.

DIVISION 6. FEATURES OF FIRE PROTECTION

SECTION 10.2.6.1 CONSTRUCTION AND COMPARTMENTATION

- A. Buildings or structures occupied or used in accordance with the individual occupancy Division (Divisions 8 through 17 of this Chapter) shall meet the minimum construction requirements of those Divisions.
- B. Appropriate provisions of PD 1096 and its IRR (National Building Code) shall be used to determine the requirements for the construction classification.
- C. Where the building or facility includes additions or connected structures of different construction types, the rating and classification of the structure shall be as follows:
 1. Two-hour (2-hr) fire resistance rating or greater, if vertically-aligned fire barrier wall exists between the portions of the building, and
 2. The least fire-resistive type of construction of the connected portions, if no such separation is provided.

SECTION 10.2.6.2 PROTECTION OF VERTICAL OPENING AND COMBUSTIBLE CONCEALED SPACES

A. General

1. Every stairway, elevator shaft, light and ventilation shaft, chute and other opening between storeys shall be enclosed or protected to prevent the spread of fire or smoke, except openings of building protected by automatic fire suppression system as permitted by other Section of this Rule.
2. In any building with low or ordinary hazard occupancy protected with approved, supervised sprinkler system, up to three (3) communicating floor levels are permitted without enclosure protection between floors, provided all the following conditions are met:
 - a. The arrangement is permitted by the applicable occupancy section of this Chapter;
 - b. The lowest or next to the lowest level is a street floor;

- c. The entire area, including all communicating floor levels, is sufficiently open and unobstructed so that it may be assumed that a fire or other dangerous condition in any part will be immediately obvious to the occupants of all communicating levels and areas;
- d. Exit capacity is sufficient to provide simultaneously for all occupants of all communicating levels and areas, all communicating levels in the same fire area being considered as a single floor area for purposes of determination of required exit capacity;
- e. Each floor level, considered separately, has at least one-half of its individual required exit capacity provided by an exit or exits leading directly out of that area without traversing another communicating floor level or being exposed to the spread of fire or smoke therefrom; and
- f. All requirements of this Chapter with respect to interior finish, protection of hazards, construction and other features are fully observed, without waivers, except openings in floors of educational, healthcare, and detention and correctional occupancies shall be enclosed as required in Divisions 9, 10 and 11 of this Chapter, respectively.

3. Each floor opening, as specified in paragraph A (1) of this Section shall be enclosed by substantial walls having fire resistance not less than that required for stairways, paragraph A (4) hereof, with approved fire doors at windows provided in openings therein, all so designed and installed as to provide complete barrier to the spread of fire or smoke through such openings.
4. The enclosing walls of floor openings serving stairways or ramps shall be so arranged as to provide a continuous path of escape including landings and passageways, in accordance with Section 10.2.5.4 of this IRR providing protection for person using the stairway or ramp against fire or smoke therefrom in other parts of the building. Such walls shall have fire resistance rating as follows:
 - a. New buildings four storeys or more in height - two (2) hours fire resistance rating.
 - b. New buildings below four storeys - One (1) hour fire resistance rating.

B. Special Provisions for Escalator Openings

Any escalator shall have its floor opening enclosed or protected as required for other vertical openings, except in building completely protected by approved, supervised sprinkler system in accordance with

Section 10.2.6.5 of this IRR, escalator opening may be protected by anyone of the methods as described in paragraph C through E below.

C. Sprinkler Vent Method

1. Under the conditions specified in paragraph B (1) above, escalator openings may be protected by the "sprinkler-vent" method, consisting of a combination of an automatic or smoke detection system, automatic exhaust system and an automatic water curtain meeting the design and other requirements as specified in this succeeding sections.
2. The exhaust system shall be of such capacity as to create a downdraft through the escalator floor opening. The downdraft has an average velocity of not less than ninety one and half meters per minute (91.5 m/min) under normal conditions for a period of not less than thirty (30) minutes.
3. Operation of the exhaust system for any floor opening shall be initiated by an approved device in the storey involved and shall be any one of the following means in addition to a manual means of opening and testing the system.
 - a. Thermostats - fixed temperature, rate-of-rise, or a combination of both.
 - b. Water flow in the sprinkler system.
 - c. Approved supervised smoke detection. Smoke detection devices, if used, shall be located that the presence of smoke is detected before it enters the stairway.
4. Electric power supply to all parts of the exhaust system and its control devices shall be designed and installed for maximum reliability.
5. Any fan or duct used in connection with an automatic exhaust system shall be of the approved type (mechanical and electrical codes)and shall be installed and maintained in accordance with good engineering practice.
6. Periodic tests, not less frequently than quarterly, shall be made of the automatic exhaust system to maintain the system and the control devices in good working conditions.
7. The water curtain shall be formed by open sprinklers or spray nozzles so located and spaced as to form a complete and continuous barrier along all exposed sides of the floor opening and reaching from the ceiling to the floor. Water intensity for water curtain shall be not less than approximately thirty seven and one-fourth liters per minute (37.25

L/min) per linear meter of water curtain, measured horizontally around the opening.

8. The water curtain shall operate automatically from thermal responsive elements of fixed temperature type so placed with respect to the ceiling (floor) opening that the water curtain comes into action upon the advance of heat toward the escalator opening.
9. Every automatic exhaust system, including all motors, controls and automatic water curtain system shall be supervised in an approved manner, similar to that specified for automatic sprinkler system supervision.

D. Spray Nozzle Methods

1. Under the conditions specified in paragraph "B" (1) above, escalator openings may be protected by the nozzle method, consisting of a combination of an automatic fire or smoke detection system and a system of high velocity water spray nozzle meeting the following requirements:
 - a. Spray nozzles shall be in the open type and shall have a solid conical spray pattern with discharged angles between forty-five (45) and ninety (90) degrees. The number of nozzles, their discharge angles and their location shall be such that the escalator opening between the top of the wellway housing and the treadway will be completely filled with the dense spray on operation of the system.
 - b. The number and size of nozzles and water supply shall be sufficient to deliver a discharge of one and four-tenths (1.4) liters of water per square meter per second through the wellway, area to be figured perpendicular to treadway.
 - c. Spray nozzles shall be so located as to effectively utilize the full advantage of the cooling and counterdraft effect. They shall be so positioned that the center line of spray discharge is as closely as possible in line with the slope of the escalator, not more than an angle of thirty (30) degrees with the top slope of the wellway housing. Nozzles shall be positioned, also so that the center line of discharge is an angle of not more than an angle of thirty (30) degrees with the top slope of the wellway housing.
 - d. Spray nozzles shall discharge at a minimum pressure of 172 KPa. Water supply piping may be taken from the sprinkler system, provided that in so doing an adequate supply of water will be available for the spray nozzles and the water pressure at the sprinkler farthest from the supply riser is not reduced beyond the required minimum.

- e. Control valves shall be readily accessible to minimize water damage.
- f. A noncombustible draft curtain shall be provided extending at least fifty one (51) centimeters below and around the opening and a solid non-combustible wellway housing at least one and a half (1.5) meter long measured parallel to the handrail, and extending from the top of the handrail enclosure to the soffit of the stairway or ceiling above, at each escalator floor opening. When necessary, spray nozzles shall be protected against mechanical injury or tampering that might interfere with proper discharge.
- g. The spray nozzle system shall operate automatically from thermal response elements of the fixed temperature type, so placed with respect to the ceiling (floor) opening that the spray nozzle system comes into action upon the advance of heat towards the escalator opening. Supervised smoke detector located in or near the escalator opening may be used to sound an alarm. The spray nozzle systems shall also be provided with manual means of operation.
- h. Control valves for the spray nozzle system and approved smoke detection or thermostatic devices shall be supervised in accordance with applicable provisions of Section 10.2.6.4 of this IRR.

E. Partial Enclosure Method

- 1. Under the conditions specified in paragraph B of Section 10.2.6.2 of this IRR, escalator opening may be protected by a partial enclosure, so designed as to provide an effective barrier to the spread of smoke from floor to floor.
- 2. Partial enclosure shall be of construction providing fire resistance equivalent to that specified for stairway enclosures in the same building, with openings therein protected by approved self-closing fire doors or may be of approved wired glass and metal frame construction with wired-glass panel doors. Such doors may be equipped with electric opening mechanism to open the door automatically upon the approach of a person. However, the mechanism shall be such as to return the door to its closed position upon any interruption of electric current supply, and the adjustment shall be such that the pressure of smoke will not cause opening of the door.

F. Firestopping Concealed Spaces

- 1. In new construction, any concealed space, in which materials having

a flame-spread rating greater than Class A as defined in Section 10.2.6.3 of this IRR are exposed, shall be effectively fire-stopped as provided below, with approved materials, unless the space is sprinkled in accordance with Section 10.2.6.5 of this IRR.

- a. Every exterior and interior wall and partition shall be firestopped at each level, at the top storey ceiling level, and at the level of support for roofs.
- b. Every unoccupied attic space shall be subdivided by firestops into areas not to exceed two hundred eighty (280) square meters.
- c. Any concealed space between the ceiling and the floor or roof above shall be firestopped for the full depth of the space along the line of support of the floor or roof structural members and, if necessary at other locations to form areas not to exceed ninety three square meters (93 m^2) for any space between the ceiling and floor and two hundred eighty square meters (280 m^2) for any space between the ceiling and the roof.

2. In every existing building, firestopping shall be provided as required by the provisions of Divisions 8 through 17 of this Chapter.

SECTION 10.2.6.3 INTERIOR FINISH

A. General

1. Interior finish means the exposed interior surfaces of buildings including, but not limited to fixed or movable walls and partitions, columns, and ceilings. For requirements on decorations and furnishing, see paragraph B of Section 10.2.18.1 of this IRR.
2. A finish floor or covering shall be exempt from the requirements of this Section provided however; that in any case where the City/Municipal Fire Marshal having jurisdiction finds a floor surface of unusual hazard the floor surface shall be considered a part of the interior finish for the purposes of this Chapter.
3. Interior finish materials shall be grouped in the following classes, in accordance with their flame spreads rating.
 - a. **Class A Interior Finish**

Flame Spread 0.25. Include any material classified at 25 or less on the test scale described in paragraph (4) hereof. Any element thereof when so tested shall not continue to propagate fire;

b. Class B Interior Finish

Flame Spread 26-75. Includes any material classified at more than 25 but not more than 75 on the test scale described in paragraph (4) hereof;

c. Class C Interior Finis

Flame Spread 76-200. Includes any material classified at more than 75 but not more than 200 on the test scale described in paragraph (4) hereof;

d. Class D Interior Finish

Flame Spread 201 -500. Includes any material classified at more than 200 but not more than 500 on the test scale described in paragraph (4) hereof, and

e. Class E Interior Finish

Flame Spread over 500. Includes any material classified at over 500 on the test scale described in paragraph (4) below.

4. Interior finish materials as specified in paragraph (3) above shall be classified in accordance with the Method of Test of Surface Burning Characteristics of Building Materials, NFPA Pamphlet No. 255.

B. Fire Retardant Paints

1. In existing buildings the required flame spread classification of interior surfaces may be secured by applying a proven fire retardant paints or solutions to existing interior surfaces having a higher flame spread rating than permitted.
2. Fire retardant paints or solution shall be renewed at such intervals as necessary to maintain the necessary fire retardant properties.

C. Automatic Sprinklers

Where approved, supervised automatic sprinklers is installed, interior finish with flame spread rating not over Class C may be used in any location where Class B is normally specified, and with rating of Class B in any location where Class A is normally specified, unless specifically prohibited in this IRR.

D. Use of Interior Finishes

1. Interior finish material shall be used in accordance with requirements for individual classes of occupancy specified elsewhere in the Rule. Wherever the use of any class of interior finish is specified, the use of a

class of lower flame spread rating shall be permitted; e.g., where Class B is specified, Class A may be used.

2. In all new buildings other than private residences Class A or Class C interior shall be used in all basements or other underground spaces from which there is no direct exit to the outside of the building, if subject to occupancy for any purpose other than storage or service facilities.
3. Interior finish of Class E shall not be used in any room space subject to human occupancy, except to such extent as may be specifically permitted by the City/Municipal Fire Marshal having jurisdiction on the basis of finding that such use does not significantly increase the life hazard, provided, however, that such use of Class E interior finish shall not in any case exceed ten (10%) percent of the aggregate interior surface of the walls and ceiling of the room or space in which such Class E material is located.

SECTION 10.2.6.4 FIRE DETECTION, ALARM, AND COMMUNICATION SYSTEMS

A. General

1. Fire detection, alarm, and communication systems if required by Division 8 through 17 of this Chapter shall be in accordance with NFPA 72 and the Philippine Electrical Code.
2. When a required fire alarm system is out of service for more than 4 hours in a 24-hour period, the City/Municipal Fire Marshal having jurisdiction shall be notified within 24 hours, and a fire watch shall be assigned until the fire alarm system has been returned to service.
3. To ensure operational integrity, the fire alarm system shall have an approved maintenance and testing program which shall be developed by the building management in accordance with internationally accepted standards. Records of conducted maintenance and testing should be maintained and submitted together with FALAR 3 when required by the Chief, BFP or his duly authorized representative.

B. Signal Initiation

1. As provided in Divisions 8 through 17 of this Chapter, activation of the complete fire alarm system shall be initiated by, but not be limited to, any or all of the following means of initiation:
 - a. Manual initiation.
 - b. Automatic detection.
 - c. Extinguishing system operation.

2. Manual fire alarm boxes shall be used only for fire protective signaling purposes.
3. A manual fire alarm box shall be provided in the natural path of escape from fire near each exit from an area and shall be readily accessible, unobstructed and at visible points.
4. Additional fire alarm boxes shall be so located that from any part of the building not more than thirty meters (30 m) horizontal distance on the same floor must be traversed in order to reach a fire alarm box.
5. For fire alarm systems using automatic fire detection or waterflow detection devices, at least one manual fire alarm box shall be provided to initiate a fire alarm signal. This manual fire alarm box shall be located where required by the city/municipal fire marshal or his duly authorized representative.
6. Where a sprinkler system provides automatic detection and alarm initiation it shall be provided with an alarm initiation device which will operate when the flow of water is equal to or greater than that from a single automatic sprinkler.
7. Where a complete smoke detection system is required by another section of this Code, automatic detection of smoke shall be provided in all occupiable areas, common areas, and work spaces in those environments suitable for proper smoke detector operation.

C. Smoke Alarms

Where required by Division 8 through 17 of this Chapter, single-station smoke alarms and multiple station smoke alarms shall be in accordance with NFPA 72.

D. Occupant Notification

1. Occupant notification shall provide signal notification to alert occupants of fire or other emergency as required by other sections of this code.
2. A presignal system may be permitted where the initial fire alarm signal is automatically transmitted without delay either to the nearest fire station, a fire brigade or to an on-site staff person trained to respond to a fire emergency.
3. A positive alarm sequence may be permitted, provided that it is in accordance with NFPA 72.
4. Notification signals for occupants to evacuate shall be by audible and visible signals in accordance with NFPA 72, or other means of notification subject to the determination and approval of the

City/Municipal Fire Marshal having jurisdiction.

5. The general evacuation alarm signal shall operate throughout the entire building.

E. Emergency Forces Notification

1. When required by Division 8 through 17 of this Chapter, emergency forces notification shall be provided to alert the nearest fire station and fire brigade in case of fire or other emergency.
2. Where fire department notification is required by another section of this code, the fire alarm system shall be arranged to transmit the alarm automatically via any of the following means which shall be in accordance with NFPA 72:
 - a. auxiliary fire alarm system
 - b. central station connection accredited by the BFP
 - c. proprietary system
 - d. remote station connection
3. Automatic fire department notification through central station accredited by the BFP shall be mandatory to the following types of occupancy:
 - a. All high rise buildings;
 - b. All hospitals;
 - c. All educational institutions, hotels and apartment buildings (condominium) of at least four (4) storey in height;
 - d. All highly hazardous occupancies; and
 - e. All mall buildings.

F. Emergency Control

1. A fire alarm and control system shall be arranged to activate automatically the control functions necessary to make the protected premises safer for building occupants.
2. Where required, the following functions shall be activated by the complete fire alarm system:
 - a. release of hold-open devices for doors or other opening protectives;

- b. stairwell or elevator shaft pressurization;
 - c. smoke management or smoke control systems; and
 - d. unlocking of doors
3. The functions specified in para (2) above shall be permitted to be activated by any fire alarm and control system where otherwise not required by this code. Additionally, such a fire alarm and control system shall be permitted to recall elevators, if the activation of the system for this purpose comes only from elevator lobby, hoistway, or associated machine room detectors.

G. Location of Controls

Operator controls, alarm indicators, and manual communications capability shall be installed in a control center at a convenient location acceptable to the City/Municipal Fire Marshal having jurisdiction.

H. Annunciation

1. Where alarm annunciation is required by another section of this IRR, it shall comply with the requirements of the para (2) through para (7) below.
2. Alarm annunciation at the control center shall be by means of audible and visible indicators.
3. For the purposes of alarm annunciation, each floor of the building, other than floors of existing buildings, shall be considered as not less than one zone, unless otherwise permitted by another section of this code.
4. Unless otherwise permitted by another Section of this Code, if a floor area exceeds one thousand eight hundred sixty square meters (1860 m²), additional zoning shall be provided, and the length of any single zone shall not exceed ninety one meters (91 m) in any direction.

Exception: where the building is provided with automatic sprinklers throughout, installed in accordance with Section 10.2.6.5 of this IRR, the area of the alarm zone shall be permitted to coincide with the allowable area of the sprinkler zone.

5. A system trouble signal shall be annunciated at the control center by means of audible and visible indicators.
6. A system supervisory signal shall be annunciated at the control center by means of audible and visible indicators.
7. Where the system serves more than one building, each building shall be considered separately.

SECTION 10.2.6.5 AUTOMATIC SPRINKLERS AND OTHER EXTINGUISHING EQUIPMENT

A. General

1. Automatic sprinklers if required by Division 8 through Division 17 of this Chapter shall be in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems
2. All automatic sprinkler and standpipe systems required by this code shall be inspected, tested, and maintained in accordance with NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems. Records of conducted maintenance and testing should be maintained and submitted together with FALAR 3.
3. Where a required automatic sprinkler system is out of service for more than 4 hours in a 24-hour period, the owner shall notify the nearest fire station immediately upon discovery but not later than 24 hours and a fire watch shall be assigned until the sprinkler system has been returned to service.
4. Sprinkler impairment procedures shall comply with NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.

B. Supervision

1. Supervisory Signals

Where supervised automatic sprinkler systems are required by another Section of this Code, supervisory attachments shall be installed and monitored for integrity in accordance with NFPA 72, a distinctive supervisory signal shall be provided to indicate a condition that would impair the satisfactory operation of the sprinkler system. Monitoring shall include, but shall not be limited to, monitoring of control valves, fire pump power supplies and running conditions, water tank levels and temperatures, tank pressure, and air pressure on dry-pipe valves. Supervisory signals shall sound and shall be displayed either at a location within the protected building that is constantly attended by qualified personnel or at an approved, remotely located receiving facility.

2. Alarm Signal Transmission

Where supervision of automatic sprinkler systems is required, waterflow alarms shall be transmitted to an approved, proprietary alarm receiving facility, a remote station, a central station, or the fire station.

C. Other Automatic Extinguishing Equipment

1. In any occupancy where the character of the potential fuel fire is such that extinguishment or control of fire will be more effectively accomplished by a type of automatic extinguishing systems other than automatic sprinkler system such as but not limited to carbon dioxide, dry chemical, foam, or water spray, a standard extinguishing system of appropriate type shall be installed subject to the approval of the City/Municipal Fire Marshal having jurisdiction.
2. If the extinguishing system is installed in lieu of a required, supervised automatic sprinkler system, the activation of the extinguishing system shall activate the building fire alarm system, where provided. The activation of an extinguishing system that is not installed in lieu of a required, supervised automatic sprinkler system shall be indicated at the building fire alarm system, where provided.

D. Manual Extinguishing Equipment

1. Any fire extinguisher provided shall be installed, inspected and maintained in accordance with Section 10.2.6.7 of this IRR.
2. Each standpipe and hose system provided shall be in accordance with Section 10.2.6.6 of this IRR

SECTION 10.2.6.6 STANDPIPES

- A. The design, installation and maintenance of Standpipe Systems shall be in accordance with NFPA 14, Standard for the Installation of Standpipe, Private Hydrant and Hose Systems.

B. Classes of Standpipe System

1. A standpipe system shall be any of the following:
 - a. **Class I System.** This system is provided with 64 mm (2 ½ in.) hose connections for full-scale firefighting at the following designated building locations:
 - i. At each intermediate landing between floor levels in every required exit stairway;
 - ii. On each side of the wall adjacent to the exit openings of horizontal exits;
 - iii. In each exit passageway at the entrance from the building areas into the passageway;

- iv. In covered mall buildings, at the entrance to each exit passageway or exit corridor, and at exterior public entrances to the mall;
- v. At the highest landing of stairways with stairway access to a roof and on the roof where stairways do not access the roof. An additional 64 mm (2 ½ in) hose connection shall be provided at the hydraulically most remote riser to facilitate testing of the system;
- vi. Where the most remote portion of a nonsprinklered floor or storey is located in excess of 40 meters of travel distance from a required exit containing or adjacent to a hose connection, or the most remote portion of a sprinklered floor or storey is located in excess of 61 meters of travel distance from a required exit containing or adjacent to a hose connection, additional hose connections shall be provided, in approved locations, where required by the BFP.

b. **Class II System.** This a hose connection provided with 38 mm (1 ½ in.) hose or within thirty seven meters (37 m) of a hose connection system shall be provided with 38 mm (1 ½ in.) hose connections for first aid fire fighting, so that all portions of each floor level of the building are within forty meters (40 m) of provided with less 38 mm (1 ½ in.) hose. Distances shall be measured along a path of travel originating at the hose connection.

c. **Class III System.** This system shall be provided with hose connections as required for both Class I and Class II system

C. Dry Standpipes

1. Dry standpipes shall be used for Class I system.
2. All buildings with required enclosed stairway or smokeproof enclosure shall have at least one dry standpipe outlet connection located at every floor level landing above the first floor of every required enclosure. No point within a building, requiring dry standpipes, shall be more than forty meters (40 m) travel distance from a dry standpoint outlet connection.
3. Dry standpipes shall not be concealed in building walls or built into pilasters. Portions of dry standpipes systems not located within an enclosed stairway or smokeproof enclosure shall be protected by a degree of fire resistance equal to that required for vertical enclosures in the building in which they are located.

4. Detailed Requirements

- a. **Construction.** Fittings and connections shall be of sufficient strength to withstand 300 psi (21 kg/cm²) of water pressure when ready for service. All dry standpipes shall be tested hydrostatically to withstand not less than 50 psi (3.5 kg/cm²) above the maximum working pressure.
- b. **Piping.** All horizontal runs of dry standpipes systems shall have a twenty (20%) percent slope for the purpose of draining. Where pipe traps occur in such standpipes systems including fire service connections, they shall be provided with drains. Pipings shall not pass through hazardous areas and shall be located so that it is protected from mechanical and fire damage.
- c. **Size.** The size of the standpipe shall have a diameter of at least 102 mm (4 in.) in buildings in which the highest outlet is twenty three (23) meters or less above the fire service connections and shall not be less than 153 mm (6 in.) where the highest outlet is higher than twenty three meters (23 m) above the fire service connection.
- d. **Fire Service Connections.** Fire service connections shall be in the street side of the buildings, fully visible and recognizable from the street or nearest point of fire apparatus accessibility. And shall be located and arranged so that hose lines can be attached to the inlets without interference from nearby objects, including buildings, fences, posts, or other fire service connections.

All one hundred two millimeters (102 mm) dry standpipes shall be equipped with a four-way fire service connection. All fire service connections shall be located on a street front, not less than forty six centimeters (46cm) or more than one hundred twenty two centimeters (122cm) above grade and shall be equipped with an approved straight way check valve and substantial plugs or caps. All fire service connections shall be protected against mechanical injury and shall be visible and accessible. More than one fire service connection may be required.

- e. **Valves.** Connections other than for fire service use shall be provided with an approved indicating-type valve and check valve located close to the supply such as tanks, pumps, and connections from waterworks system. Valves shall be provided to allow isolation of a standpipe without interrupting the supply to other standpipes from the same source of supply.
- f. **Outlets.** Each standpipe shall be equipped with an approved sixty four millimeters (64 mm) outlet not less than sixty one centimeters

(61 cm) nor more than one hundred twenty two centimeters (122 cm) above the floor of each storey. All dry standpipe shall be equipped with a two way sixty four millimeters (64 mm) outlet above the roof line of the building when the roof has a slope of less than thirty centimeters (30 cm) long wrench may be used in connecting the hose with clearance for the wrench on all sides of the outlet. Standpipes located in smokeproof enclosures shall have outlets located in the vestibule or on the balcony. Standpipes outlets in stairway enclosures or smoke towers shall be so located that the exit doors do not interfere with the use of the outlet. All outlets shall be equipped with an approved valve cap and chains.

- g. **Signs.** An approved durable sign with raised letters of at least twenty five millimeters (25mm) in height shall be permanently attached to all fire Service street connections, cast on a plate or fitting that reads "**DRY STANDPIPE**". A sign indicating the pressure required at the inlets to deliver the system demand shall also be provided.

D. Wet Standpipes

1. Wet standpipe system extending from the cellar or basement into the topmost storey shall be required in the following:
 - a. Assembly occupancies with an occupant load exceeding one thousand (1,000);
 - b. Educational, healthcare and detention and correctional, business and mercantile, industrial, and hotels and apartments occupancies, four or more storeys in height, and
 - c. Hazardous storage and business and mercantile occupancies having a floor area exceeding one thousand eight hundred sixty square meters (1,860 m²) per floor.
2. However, the preceding provision does not apply to:
 - a. Buildings equipped throughout with an approved, supervised sprinkler system.
 - b. Basement or cellars equipped with approved, supervised sprinkler system.
3. **Location**
 - a. Wet standpipes shall be located so that all portions of the buildings are within six meters (6m) of a nozzle attached to twenty two meters (22 m) of hose.

b. In theaters, auditoriums and other assembly occupancies where the occupant load is more than one thousand (1,000), outlets shall be located on each side of any stage, on each side of the rear of the auditorium and on each side of the balcony.

4. Detailed Requirements

- a. **Construction.** Wet standpipes shall be installed and tested as required for the water distribution system within the building.
- b. **Size.** The size of the standpipes shall not be less than 64 mm (2 ½ in.) in diameter.
- c. **Outlets.** All interior wet standpipes shall be equipped with thirty eight millimeters (38 mm) valve in each storey, including the basement or cell roof of the building and located not less than ninety one centimeters (91cm) nor more than one hundred eighty two centimeters (182 cm) above the floor.
- d. **Water Supply.** The wet standpipe shall deliver not less than one hundred thirty two liters (132 l) of water per minute at not less than one and eight-tenths (1.8) kilos per square centimeters residual pressures from each of any two outlets flowing simultaneously for thirty (30) minutes. When more than one interior wet standpipe is required in the building, such standpipes may be connected at their bases or highest points by pipes of equal size. Where combination standpipes are installed, the thirty eight millimeters (38 mm) outlet system may be supplied from the combination system with a fifty one millimeters (51 mm) connecting line.
- e. **Pressure and Gravity Tanks.** Pressure or gravity tanks shall have a capacity sufficient to furnish at least two hundred sixty five (265) liters of water per minutes for thirty (30) minutes. Other such tanks shall be located so as to provide not less than one and eight-tenths (1.8) kilos per square centimeters residual pressure from each of two (2) outlets flowing simultaneously for thirty (30) minutes. Discharge pipes from pressure tanks shall extend five (5) centimeters from and into the bottom of such tanks. All tanks shall be equipped with a manhole, ladder and platform, drainpipe, water pressure gauges, and a pressure relief valve. Each pressure tanks shall be tested in place after installation and proved tight at a hydrostatic pressure required, but not less than ten (10) kilogram per square centimeters. Where such tanks are used also for domestic purposes, the supply take off for such purposes shall be located above the required capacity of such tanks. Supply tanks shall be supported on non-combustible construction with not less than ninety one (91) centimeters clearances over the top and

under the bottom of an adjacent construction. Approved pressure gauges shall be provided at pressure tanks and at the fire pump.

- f. **Fire Pumps.** Fire pumps shall be approved and shall deliver not less than the required fire flow and pressure. Such pumps shall be supplied with adequate power source and shall be automatic in operation. Where the wet standpipe system is supplied with water from the domestic supply of building, approved fire pumps shall not be required provided the domestic pump used delivers the required fire flow.
- g. **Hose and Hose Reels.** Each wet standpipe outlet shall be supplied with a hose not less than thirty eight millimeters (38 mm) in diameter. Such hose shall be equipped with an approved variable nozzle. An approved hose reel rack or cabinet shall be provided and shall be located so as to make the hose accessible. The hose reel rack or cabinet shall be recessed in the wall or protected by suitable cabinet.
- h. **Connection to Fire-Sprinkler System.** Wet standpipe system may be supplied from a sprinkler system only when a compliance with NFPA 13, Standard for the Installation of Sprinkler System.
- i. **Signs.** Signs shall be provided. If automatic sprinklers are also supplied by the fire service connection, the sign or combination of signs shall indicate both designated services. The sign shall read "**STANDPIPE AND AUTOSPKR**" or "**AUTOSPKR AND STANDPIPE**".
- j. **Pressure Reduction.** Where the static pressure at any standpipe outlet exceeds seven (7) kilos per square-centimeter, an approved pressure reduction device shall be permanently installed at the outlet to reduce the water flow so that the nozzle pressure does not exceed five and six tenths (5.6) kilos per square centimeter in accordance with Table 7.

**Table 7: STANDPIPE PRESSURE AT HOUSE
OUTLET AND SIZE OF ORIFICE**

Standpipe Pressure at House Outlet (Kilograms per square centimeter)	Size of Orifice (millimeter)
7.75	27.0
8.45	23.0
9.15	23.8
9.86	19.1
10.6	18.3
11.27	17.5

Standpipe Pressure at House Outlet (Kilograms per square centimeter)	Size of Orifice (millimeter)
11.97	16.7
12.68	15.9
14.08	15.1
15.85	14.3
17.61	13.5
19.72	12.7

E. Combination Standpipes

1. All combination standpipes shall comply with the requirements of this Section. Design and installation shall be in accordance with NFPA 14, Standard for the Installation of Standpipe, Private Hydrant and Hose Systems. Where a combination standpipe system is installed in accordance with section, a separate dry standpipe system need not be installed.
2. Required combination standpipes shall be maintained in accordance with this Section.

3. Location

- a. Combinations standpipe system shall have connections for dry standpipe located as required in para "C" above and shall have wet standpipe outlets as required in para "D" above.
- b. Portions of combination standpipe systems, including extensions for wet standpipe outlets, not within an enclosed stairway or smokeproof enclosure shall be protected by a degree of fire resistance equal to that required for vertical enclosures in the building in which they are located.
- c. In buildings where more than one combination standpipe system is provided, they shall be cross connected at the bottom.

4. Detailed Requirements

- a. **Construction.** Combination standpipe system shall be installed and tested as required for dry standpipe system in accordance with para "C" above.
- b. **Size.** Combination standpipe system shall not less than one hundred fifty millimeters (150 mm) in diameter.

- c. **Riser shut off valve and drain.** Each individual riser must be equipped with an OS and Y valve at its base and an approved valve for draining.
- d. **Fire Service Connections.** All combination standpipe systems shall be equipped with a four-way fire service connection. Combination standpipe system with three or more standpipes shall be provided with not less than two four-way service inlet connection.
- e. All fire service connections shall be located on a street front not less than forty six centimeters (46 cm) nor more than one hundred twenty two centimeters (122 cm) above grade and shall be equipped with an approved straight-way check valve and substantial plugs or caps. All fire service connections shall be protected against mechanical injury and shall be visible and accessible. The number
- f. **Outlets.** Every standpipe shall be equipped with a sixty four millimeters (64 mm) outlet of not less than sixty one centimeter (61 cm) nor more than one hundred twenty two centimeter (122 cm) above the floor level at each storey. All standpipes shall be equipped with three-way sixty four millimeters (64 mm) outlet above the roof line when the roof has a slope of less than thirty four percent (34%). Roof outlets are not required for roofs with a greater than thirty four (34%) percent. All outlets shall be installed so that a thirty centimeters (30 cm) long wrench may be used in connecting the hose with wrench clearance on all sides of the outlet. Standpipes located in smokeproof enclosures shall have outlets at the vestibule with thirty meters (30 m) of sixty four millimeters (64 mm) approved unlined fabric hose with twenty five and four-tenths millimeters (25.4 mm) orifice, straight-tipped brass nozzle without a shutoff at the nozzle unless waived by the Chief, BFP or his duly authorized representative. Such outlets shall be identified with a sign having seventy six millimeter (76 mm) high letters reading; "**BFP USE ONLY**". The hose and nozzle shall be installed in an approved hose cabinet. An approved drip cock or drain connection shall be located between the standpipes outlet and the hose. Roof outlets need not be provided with hoses.
- g. **Signs.** An approved durable sign with raised letter at least twenty five millimeters (25mm) high shall be permanently attached to all fire service street connections and test connection, and such sign shall read "**COMBINATION STANDPIPE AND TEST CONNECTION**".

F. Building Under Construction

1. During the construction of the building and until the permanent fire-extinguishing system has been installed and is in service, fire protection shall be provided in accordance with this Section.
2. Every building, six storeys or more in height, shall be provided with not less than one standpipe for fire service use during construction. Such standpipes shall be installed when the progress of construction is not more than fifteen meters (15m) in height above grade. Such standpipe shall be provided with fire service inlet connecting at accessible locations adjacent to usable stairs. Such standpipe system shall be extended as construction progresses to within one floor of the highest point of construction having secured decking or flooring.
3. In each floor there shall be provided sixty four millimeter (64mm) valve outlet for fire service use. When construction height requires installation of a combination standpipe, fire pumps and water main connection shall be provided to serve the standpipe.
4. Temporary standpipes may be provided in place of permanent system if they are designed to furnish two hundred eighty four liters (284l) of water per minute at three and one half kilograms (3.5 kg) per square centimeters pressure with a standpipe of not less than ten centimeters (10 cm). All outlets shall not be less than sixty four millimeters (64 mm). Pumping equipment sufficient.
5. Standpipe system for building under construction shall be installed as required for permanent standpipe system.

G. Basement Pipe Inlets

1. Basement pipe inlets shall be installed in the first floor of every storey, warehouse, or factory having cellar or basement.
2. The location of basement/pipe inlet shall be as required by the City/Municipal Fire Marshal having jurisdiction.
3. All basement pipe inlets shall be of cast iron, steel, brass, or bronze with lids of cast bronze.
4. The basement pipe inlet shall consist of a sleeve not less than twenty centimeter (20cm) inside diameter extending through the floor and terminating flush with or through the basement or cellar ceiling and shall have a top flange recessed with an inside shoulder to receive the lid. The top flange shall be installed flush with finish floor surface. The lid shall be a solid casting and have a lift recesses in the top. This lid shall be provided with a casting sign reading: "**FIRE SERVICE ONLY, DO NOT**

COVER." The lid shall be installed in such a manner to permit its easy removal from the flange shoulder.

- H. Standpipe hose threads and pressure regulation device settings shall be compatible with the threads, hose and nozzles used by the BFP.
- I. Each standpipe shall be provided with a means of draining. A drain valve and piping, located at the lowest point of the standpipe piping downstream of the isolation valve, shall be arranged to discharge water at an approved location. Sizing shall be specified in Table 8 below.

Table 8: SIZING FOR STANDPIPE DRAINS

STANDPIPE SIZE (in)	SIZE OF DRAIN CONNECTION (in)
Up to 2	$\frac{3}{4}$ or larger
$2\frac{1}{2}$, 3, or $3\frac{1}{2}$	$1\frac{1}{4}$ or larger
4 or larger	2 only

SECTION 10.2.6.7 PORTABLE AND WHEELED FIRE EXTINGUISHERS

- A. The City/Municipal Fire Marshal having jurisdiction shall designate the type and number of fire extinguishers to be installed and maintained in all buildings, structures and facilities, but shall not be less than the minimum requirements as outlined in this Section.
- B. All buildings, structures and facilities shall be installed with portable fire extinguishers that are designed, installed and maintained in accordance with this Section. Fire extinguishers shall be installed even if the property is equipped with automatic sprinklers, standpipe and hose, or other fixed protection equipment.
- C. **Classification of Hazards**

The classification of Hazard for purposes of application of this section shall be as follows:

1. Low Hazard

Light hazard occupancies are locations where the total amount of Class A combustible materials, including furnishings, decorations, and contents, is of minor quantity. This can include some buildings or rooms occupied as offices, classrooms, churches, assembly halls, guest room areas of hotels/motels, and so forth. This classification anticipates that majority of content items are either noncombustible or so arranged that a fire is not likely to spread rapidly. Small amounts of class B flammables used for duplicating machines, art departments, and so forth, are included, provided that they are kept in closed containers and safely stored.

2. Moderate Hazard

Ordinary hazard occupancies are locations where the total amount of Class A combustibles and Class B flammables are present in greater amounts than expected under light (low) hazard occupancies. These occupancies could consist of dining areas, mercantile shops, and allied storage; light manufacturing, research operations, auto showrooms, parking garages, workshop or support service areas of light (low) hazard occupancies; and warehouses containing Class I or Class II commodities as defined by NFPA 231, Standard for General Storage.

3. High Hazard

Extra hazard occupancies are locations where the total amount of Class A combustibles and Class B flammables present, in storage, production, use, finished product, or combination thereof, is over and above those expected in occupancies classed as ordinary (moderate) hazard. These occupancies could consist of woodworking, vehicle repair, aircraft and boat servicing, cooking areas, individual product display showrooms, product convention center displays, and storage and manufacturing processes such as painting, dipping, and coating, including flammable liquid handling. Also included is warehousing of or in-process storage of other than Class I and Class II commodities.

D. Classification, Ratings, and Performance of Fire Extinguishers

1. Portable fire extinguishers are classified for use on certain classes of fires and rated for relative extinguishing effectiveness as determined by the Bureau of Product Standard, DTI.
2. The classification are as follows
 - a. Class A: fires involving ordinary combustible solid materials
 - b. Class B : fires in flammable and combustible liquid and gas
 - c. Class C: fires involving energized electrical equipment
 - d. Class D: fires involving combustible metal fires

E. Fire Extinguisher General Requirements

1. The classification of fire extinguishers shall consist of a letter that indicates the class of fire on which a fire extinguisher has been found to be effective, preceded by a rating number (Class A and Class B only) that indicates the relative extinguishing effectiveness, except for

fire extinguishers classified for use on Class C, Class D hazards shall not be required to have a number preceding the classification letter.

2. Portable fire extinguishers shall be maintained in a fully charged and operable condition, and kept in their designated places at all times when they are not being used.
3. Fire extinguishers shall be conspicuously located where they will be readily accessible and immediately available in the event of fire. Preferably they shall be located along normal paths of travel, including exits from areas.
4. The following types of fire extinguishers are considered obsolete and shall be removed from service:
 - a. soda acid
 - b. chemical foam (excluding film-forming agents)
 - c. vaporizing liquid (e.g., carbon tetrachloride)
 - d. cartridge-operated water
 - e. cartridge-operated loaded stream
 - f. copper or brass shell (excluding pump tanks) joined by soft solder or rivets
5. Cabinets housing fire extinguishers shall not be locked, except where fire extinguishers are subject to malicious use, locked cabinets shall be permitted to be used, provided they include means of emergency access.
6. Fire extinguishers shall not be obstructed or obscured from view, except in large rooms, and in certain locations where visual obstruction cannot be completely avoided, arrows, lights, signs, or coding of the wall are the acceptable means of identifying its location.
7. Portable fire extinguishers other than wheeled types shall be securely installed on the hanger or in the bracket supplied or placed in cabinets or wall recesses. The hanger or bracket shall be securely and properly anchored to the mounting surface in accordance with the manufacturer's instructions. Wheeled-type fire extinguishers shall be located in a designated location. Portable fire extinguishers other than wheeled types shall be securely installed on the hanger or in the bracket supplied or placed in cabinets or wall recesses. The hanger or bracket shall be securely and properly anchored to the mounting

surface in accordance with the manufacturer's instructions. Wheeled-type fire extinguishers shall be located in a designated location.

8. Fire extinguishers installed under conditions where they are subject to physical damage, (e.g., from impact, vibration, the environment) shall be adequately protected.
9. Fire extinguishers having a gross weight not exceeding eighteen kilogram (18 kg) shall be installed so that the top of the fire extinguisher is not more than one and five-tenths meter (1.5 m) above the floor. Fire extinguishers having a gross weight greater than eighteen kilogram (18 kg), except wheeled types, shall be so installed that the top of the fire extinguisher is not more than one meter (1.0 m) above the floor. In no case shall the clearance between the bottom of the fire extinguisher and the floor be less than one hundred millimeters (100 mm).
10. Extinguisher operating instructions, original manufacturer's labels, labels that specifically relate to the extinguisher's operation or fire classification, or inventory control labels specific to that extinguisher shall be located on the front face of the extinguisher and be clearly visible, except the hazardous materials identification systems (HMIS) labels, six-year maintenance labels, hydrotest labels, or other labels.
11. Fire extinguishers mounted in cabinets or wall recesses shall be placed so that the fire extinguisher operating instructions face outward. The location of such fire extinguishers shall be marked conspicuously.
12. Where fire extinguishers are installed in closed cabinets that are exposed to elevated temperatures, the cabinets shall be provided with screened openings and drains. Vented fire extinguisher cabinets should utilize tinted glass and should be constructed to prevent the entrance of insects and the accumulation of water. Vented fire extinguisher cabinets constructed in this manner will lower the maximum internal temperature 5.6°C to 8.3°C.
13. Water-type (e.g., water, AFFF, FFFP) fire extinguishers shall not be installed in areas where the temperatures are outside the range of 40°f to 120°f (4°C to 49°C). All other types shall not be installed in areas where temperatures are outside the range of -40°f to 120°f (-40°C to 49°C). Fire extinguishers shall not be exposed to temperatures outside of the range shown on the fire extinguisher label, except: where it is installed in locations subject to temperatures outside these ranges, it shall be of a type approved and listed for the temperature to which it is exposed, or it shall be placed in an enclosure capable of maintaining the stipulated temperature range.
14. The fire extinguisher owner or the owner's agent shall be provided with an instruction manual that details condensed instructions and cautions

necessary to the installation, operation, inspection, and maintenance of the fire extinguisher(s). The manual shall refer to this standard as a source of detailed instruction.

F. Selection of Fire Extinguishers

1. General Requirements

The selection of fire extinguishers for a given situation shall be determined by the character of the fires anticipated, the construction and occupancy of the individual property, the hazard to be protected, ambient-temperature conditions, and other factors. The number, size, placement, and limitations of use of fire extinguishers required shall meet the requirements of para 2 hereof.

2. Selection by Hazard

- a. Fire extinguishers shall be selected for the Classes of hazards to be protected.
 - i. Fire extinguishers for protecting Class A hazards shall be selected from the following:
 - i.a. Water type
 - i.b. Multipurpose dry chemical type
 - i.c. Wet chemical type
 - ii. Fire extinguishers for protection of Class B hazard shall be selected from the following:
 - ii.a. Aqueous film-forming foam (AFFF)
 - ii.b. Film-forming fluoroprotein foam (FFFP)
 - ii.c. Carbon dioxide
 - ii.d. Dry chemical type
 - iii. Fire extinguishers for protection of Class C hazard shall be selected from types that are specifically listed for use on Class C hazards.
 - iv. Fire extinguishers and extinguishing agents for the protection of Class D hazards shall be of types approved for use on the specific combustible-metal hazard.

3. Application for Specific Hazards

- a. Selection of fire extinguishers for **pressurized flammable liquids and pressurized gas** fires type of hazard shall be made on the basis of recommendations by manufacturers of this specialized equipment. The system used to rate the effectiveness of fire extinguishers on Class B fires (flammable liquids in depth) is not applicable to these types of hazards. It has been determined that special nozzle design and rates of agent application are required to cope with such hazards.
- b. Selection of fire extinguishers for fires involving Class B materials in motion (**three - dimensional Class B fires**) such as pouring, running, or dripping flammable liquids and generally includes vertical as well as one or more horizontal surfaces shall be made on the basis of recommendations by manufacturers of this specialized equipment.
- c. Fire extinguishers for the protection of **delicate electronic equipment** shall be selected from either a carbon dioxide type or a halogenated agent type.

G. Distribution of Fire Extinguishers

1. General Requirements

- a. Fire extinguishers shall be provided for the protection of both the building structure and the occupancy hazards contained therein.
- b. Required building protection shall be provided by fire extinguishers suitable for Class A fires.
- c. Occupancy hazard protection shall be provided by fire extinguishers suitable for such Class A, B, C, D, fire potentials as might be present.
- d. Fire extinguishers provided for building protection can be considered also for the protection of occupancies having a class a fire potential.
- e. Buildings having an occupancy hazard subject to Class B or Class C fires, or both, shall have a standard complement of Class A fire extinguishers for building protection, plus additional Class B or Class A fire extinguishers, or both. Where fire extinguishers have more than one letter classification (such as 2-A:20-B:C), they can be considered to satisfy the requirements of each letter class.

- f. Rooms or areas shall be classified generally as light (low) hazard, ordinary (moderate) hazard, or extra (high) hazard. Limited areas of greater or lesser hazard shall be protected as required.
- g. On each floor level, the area protected and the travel distances shall be based on fire extinguishers installed in accordance with Tables 1 and 2.

2. Size and Placement

a. Class A Hazards

- i. Fire extinguishers for the different types of hazards shall be provided on the basis of Table 9.

Table 9: FIRE EXTINGUISHERS FOR DIFFERENT TYPES OF CLASS A HAZARDS

TYPE OF HAZARD	MIN. EXTINGUISHER RATING	MAX. TRAVEL DISTANCE TO EXTINGUISHER (m)	MAX. AREA (OPEN AREA) PER EXTINGUISHER (m ²)
Low	2-A	15	200
Moderate	3-A*	12	100
High	4-A*	10	75

* Two 2-A rated fire extinguisher, provided they are installed adjacent to each other, may be used to fulfill the requirements of one 3-A or 4-A rated extinguisher.

- ii. The protection requirements shall be permitted to be fulfilled with fire extinguishers of higher rating, provided the travel distance to such larger fire extinguishers does not exceed fifteen meters (15 m).
- iii. In cases where building spaces are compartmentalized or separated from each other by fire barriers, each compartment not exceeding the maximum protection area specified Table 9 shall be provided with at least one (1) fire extinguisher.

b. Class B Hazards (other than for fires in flammable liquids of appreciable depth).

- i. Fire extinguishers for the different types of Class B hazards shall be provided on the basis of Table 10.

Table 10: FIRE EXTINGUISHERS FOR DIFFERENT TYPES OF CLASS B HAZARDS

TYPE OF HAZARD	MIN. EXTINGUISHER RATING	MAX. TRAVEL DISTANCE TO EXTINGUISHER (m)	MAX. AREA (OPEN AREA) PER EXTINGUISHER (m ²)
Low	5-B	10	200
Moderate	10-B	10	100
High	40-B	10	75

- ii. The protection requirements shall be permitted to be fulfilled with fire extinguishers of higher rating, provided the travel distance to such larger fire extinguishers does not exceed fifteen meters (15 m).
- iii. In cases where building spaces are compartmentalized or separated from each other by fire barriers, each compartment not exceeding the maximum protection area specified Table 10 shall be provided with at least 1 fire extinguisher.

c. **Class B Hazards in Flammable Liquids of Appreciable Depth (greater than 0.6 cm).**

- i. Portable fire extinguishers shall not be installed as the sole protection for flammable liquid hazards of appreciable depth where the surface area exceeds one square meters (1.0 m²).
- ii. For flammable liquid hazards of appreciable depth, a Class B fire extinguisher shall be provided on the basis of at least two numerical units of Class B extinguishing potential per square meters of flammable liquid surface of the largest hazard area.
- iii. Travel distances for portable fire extinguishers shall not exceed ten meters (10 m).

d. **Class C Hazards**

Fire extinguishers with Class C ratings shall be required where energized electrical equipment can be encountered that would require a nonconducting extinguishing medium. This requirement includes situations where fire either directly involves or surrounds electrical equipment. Since the fire itself is a Class A or Class B hazard, the fire extinguishers shall be sized and located on the basis of the anticipated Class A or class B hazard.

e. **Class D Hazards**

- i. Fire extinguishers or extinguishing agents with Class D ratings shall be provided for fires involving combustible metals.

- ii. Fire extinguishers or extinguishing agents (media) shall be located not more than fifteen meters (15 m) of travel distance from the Class D hazard.
- iii. Portable fire extinguishers or extinguishing agents (media) for Class D hazards shall be provided in those work areas where combustible metal powders, flakes, shavings, chips, or similarly sized products are generated.
- iv. Size determination shall be on the basis of the specific combustible metal, its physical particle size, area to be covered, and recommendations by the fire extinguisher manufacturer on data from control tests conducted.

SECTION 10.2.6.8 SEGREGATION AND PROTECTION OF HAZARDS

- A. Any process, operation or storage having a degree of hazard greater than that normal to the general occupancy of the building or structure under consideration shall be enclosed with construction having at least a 4-hour fire resistance rating or shall be provided with automatic fire protection or both, as specified in Divisions 8 through 17 of this Chapter. Where a hazard is high, both the fire-rated construction and automatic fire protection shall be used.
- B. All construction enclosing hazardous operation or storage shall have not less than 2-hour fire resistance, and all openings between the balance of the building and rooms or enclosures for hazardous operations or processes shall be protected with self-closing or automatic fire doors.
- C. Where hazardous processes or storage area of such a character as to involve an explosion hazard, explosion venting to outside the building shall be provided by thin glass or other approved vents.
- D. Where automatic protection is required, such protection shall be by automatic sprinklers in accordance with Section 10.2.6.5 of this IRR or other approved extinguishing system appropriate to extinguish fires in the hazardous materials stored or handled.

SECTION 10.2.6.9 SMOKE PARTITIONS

- A. Any smoke partition when required shall be constructed of fire resistive materials and shall form an effective member, continuous from outside wall to outside wall and from floor to floor slab thereby including continuity through all concealed, spaces, such as those found above a suspended ceiling, and including industrial spaces.
- B. Smoke partitions shall have openings only for ingress and egress and for building service equipment. Doorways shall be protected by doors meeting the provisions of paragraph "C" hereof, and any openings where

building service equipment pierces the partitions shall be closed. Transfer grills, whether equipped with fusible links, release dampers or not, shall not be used in these partitions.

C. Doors in Smoke Partitions

1. Doors in required smoke partitions shall be of a swinging type and shall have a protection rating of at least twenty (20) minutes.
2. Any glass panels in doors in smoke partitions shall be of transparent wired glass mounted in steel frames.
3. Doors in smoke partitions shall be automatically self-closing.
4. Doors in smoke partitions shall close the opening with only the clearance for proper operation under self-closing.
5. Doors in smoke partitions shall be without undercuts, louvers, or grills.

SECTION 10.2.6.10 FIRE DOORS

- A. Any fire door, installed in accordance with the requirements of this Chapter shall be of an approved type. The fire resistance rating of any fire door shall be as measured in accordance with the appropriate internationally accepted standard. Each fire door shall be appropriate for the location in which it is installed.
- B. Any swinging fire door and any door in stair enclosure walls designed to prevent the spread of fire shall be provided with approved positive latching means to hold it in the closed position against the pressure of expanding fire gases.

DIVISION 7. BUILDING SERVICE EQUIPMENT

SECTION 10.2.7.1 UTILITIES

- A. Equipment using gas and related gas piping shall be in accordance with NFPA 54, National Fuel Gas Code, or NFPA 58, Liquefied Petroleum Gas Code, as the case may be.
- B. Electrical wiring and equipment shall be in accordance with the Philippine Electrical Code.
- C. Cooking equipment shall be protected by automatic kitchen hood fire Suppression in accordance with NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.

SECTION 10.2.7.2 HEATING, VENTILATING AND AIRCONDITIONING

- A. The design and installation of air conditioning, ventilating, heating, cooking, incinerating, or other building service equipment shall be installed in accordance with the Philippine Mechanical Code.
- B. Where ducting of airconditioning and ventilating system passes through from one room to another room or from one fire barrier to another fire barrier shall be provided with automatic fire dampers.

SECTION 10.2.7.3 SMOKE VENTING

- A. Design and installation of smoke venting facilities, where required for safe use of exits, in windowless buildings, underground structures, and large area factories in accordance with the Philippine Mechanical Code.
- B. Natural draft smoke venting shall utilize roof vents in walls at or near the ceiling level. Such vents shall be normally open or if closed shall be designed for automatic opening in case of fire.
- C. Where smoke venting facilities are installed for purposes of exit safety in accordance with the requirements of this Rule, they shall be adequate to prevent dangerous accumulations of smoke during the time necessary to evacuate the area served, using available exit facilities with a standard margin of safety to allow for unforeseen contingencies.
- D. The discharge apertures of all natural draft smoke vents shall be so arranged as to be readily opened from the exterior.
- E. The required natural draft vents may be substituted by a power-operated smoke exhaust system subject to the approval of the City/Municipal Fire Marshal having jurisdiction.

SECTION 10.2.7.4 RUBBISH CHUTES, LAUNDRY CHUTES, AND FLUE-FED INCINERATORS

- A. Every chute and incinerator flue shall be enclosed and the openings therein shall be protected in accordance with Section 11.2.6.2 "A" (1) and "A" (3) of this IRR, respectively. In new construction, inlet openings serving chutes shall open only to a room that is designed and used exclusively for accessing the chute opening rubbish chutes and laundry chutes shall be permitted to open into rooms not exceeding 37 m² that are used for storage, provided that the rooms is protected by automatic sprinklers.
- B. Every incinerator flue, rubbish chute, and laundry chute shall be designed and maintained in accordance with the Philippine Mechanical Code.
- C. In new constructions, any chute other than an incinerator flue shall be provided with approved, supervised sprinkler system.

D. The above requirements shall not apply to detached single- or two-family dwellings.

SECTION 10.2.7.5 ELEVATORS AND ESCALATORS

- A. Elevator installations shall be in accordance with the PSME Code.
- B. All new elevators shall conform to the firefighters' emergency operations requirements of ASME A17.1 Safety Code for Elevators and Escalators, except buildings of less than 5-storeys in height.
- C. Elevators shall be subject to periodic inspections and tests by building management, without prejudice to the power or authority of the BFP to conduct inspections. All elevators equipped with firefighters' emergency operation in accordance with paragraph (2) hereof shall be subject to a monthly operation with a written record of the findings made and kept by the building management. Such record shall be included in the submission of FALAR 3.

SECTION 10.2.7.6 INSTALLATION CLEARANCE

All equipment/utilities/facilities mentioned in Section 10.2.7.1 to 10.2.7.5 of this IRR shall not be installed without first securing an installation clearance from the C/MFM having jurisdiction. This installation clearance shall be a pre-requisite for the issuance of permits required by law for these installations.

DIVISION 8. PLACES OF ASSEMBLY

SECTION 10.2.8.1 OCCUPANT LOAD

- A. The occupant load permitted in any assembly building, structure, or portion thereof shall be determined by dividing the net floor area or space assigned to that use by the square meter per occupant as follows:
 1. As assembly area of concentrated use without fixed seats such as an auditorium, place of worship, dance floor, and lodge room: sixty-five hundredths (0.65) square meter per person.
 2. An assembly area of less concentrated use such as conference room, dining room, drinking establishment, exhibit room, gymnasium, or lounge: one and four-tenths (1.4) square meters per person.
 3. Standing room or waiting space: twenty-eight hundredths (0.28) square meter per person.
 4. The occupant load of an area having fixed seats shall be determined by the number of fixed seats installed. Required aisle space serving the fixed seats shall not be used to increase the occupant load.

5. Every room constituting a place of assembly and not having fixed seats shall have the occupant load of the room posted in a conspicuous place near the main exit from the room. Approved signs shall be maintained in legible manner. Signs shall be durable and shall indicate the number of occupants permitted for each room.
6. In theaters and similar places of assembly where persons are admitted to the building at times when seats are not available for them and are allowed to wait in a lobby or similar space until seats are available, such use of lobby or similar spaces shall not encroach upon the required clear width of exits. Such waiting spaces shall be restricted to areas other than the required means of egress. Exits shall be provided for such waiting spaces on the basis of one person for each one-fourth (0.25) square meters of waiting space area. Such exits shall be in addition to the exits specified for the main auditorium area and shall conform in construction and arrangement to the general rules for exits given in this division.
7. In areas not in excess of nine hundred thirty square meters (930 m^2), the occupant load shall not exceed one person in forty-six tenths square meters (0.46 m^2); in areas in excess of nine hundred thirty square meters (930 m^2), the occupant load shall not exceed one person in sixty-five tenths square meters (0.65 m^2).

SECTION 10.2.8.2 EXIT DETAILS

A. Capacity of Exits

1. The capacity of means of egress shall be in accordance with Section 10.2.5.2 paragraph C or shall be in accordance with succeeding paragraph for means of egress serving theater-type seating or similar seating arranged in rows.
2. Minimum clear width of aisles and other means of egress serving theater-type seating, or similar seating arranged in rows, shall be in accordance with Table 11 below.

Table 11: CAPACITY FACTORS FOR THEATER TYPE SEATING

No. of seats	Clear width per seat served (in mm)	
	Stairs	Passageways, Ramps, and Doorways
Unlimited	7.6 AB	5.6C

3. The minimum clear widths shown in Table 11 shall be modified in accordance with all of the following:
 - a. If risers exceed one hundred seventy-eight millimeters (178 mm) in

height, multiply the stair width in Table 8 by factor A, where

$$A = 1 + (\text{RISER HEIGHT} - 178/125)$$

- b. Stairs without a handrail located within a seven hundred sixty millimeters (760 mm) horizontal distance shall be 25 percent wider than otherwise calculated, that is, multiply by factor B = 1.25.
- c. Ramps steeper than 1 in 10 slope where used in ascent shall have their widths increased by 10 percent, that is, multiply by factor C = 1.10.

B. Minimum Number of Exit

The number of exits shall be in accordance with Section 10.2.5.2 para "G" of this IRR .

C. Location of Exits

1. Main Exit

Every assembly occupancy shall be provided with a main exit. The main exit shall be of sufficient width to accommodate one-half (1/2) of the total occupant load, but shall be not less than the total required width of all aisles, exit passageways and stairways leading thereto, and shall connect to a stairway or ramp leading to a street.

2. Other Exits

Each level of an assembly occupancy shall have access to the main exit and an addition shall be provided with exits of sufficient width to accommodate two-thirds (2/3) of the total occupant load served by that level. Such exits shall open directly to a street or into an exit court, enclosed stairway, outside stairway, or exit passageway leading to a street. Such exits shall be located as far apart and as far from the main exits as practicable. Such exits shall be accessible from a cross aisle or a side aisle.

D. Minimum Corridor Width

The width of any exit access corridor serving 50 or more persons shall not be less than one hundred twelve centimeters (112 cm).

E. Travel Distance To Exits

Exits shall be so arranged that the total length of travel from any point to reach an exit will not exceed forty six (46) meters in any place of assembly for spaces not protected by approved, supervised sprinkler system and sixty one (61) meters in areas so protected.

F. Types of Exits

1. Exits of the specified number and width shall be of one or more of the following types, in accordance with the provisions of Division 5 of this Rule.
 - a. Doors of the swinging type leading directly outside or through a lobby or passageway leading to the outside of the building.
 - b. Horizontal exits
 - c. Smokeproof enclosures
 - d. Stairs
 - e. Ramps
2. Turnstiles

No turnstiles or other devices to restrict the movement of persons shall be installed in any place of assembly in such a manner as to interfere in any way with required exit facilities. (See Division 5 of this Chapter for further requirements for turnstiles).

G. Panic Hardware

An exit door from an assembly occupancy shall not be provided with a latch or lock unless it is panic hardware.

H. Seating, Aisles and Railings

1. Seating

- a. The spacing of rows of seats from back to back shall be not less than eighty three centimeters (83 cm), nor less than sixty eight centimeters (68 cm) plus the sum of the thickness of the back and inclination of the back. There shall be a space of not less than thirty centimeters (30 cm) from the back of one seat and the front of the seat immediately behind it as measured between plumb lines.
- b. Rows of seats between aisles shall have not more than fourteen (14) seats.
- c. Rows of seats opening onto an aisle at one side only shall have not more than seven (7) seats.
- d. Seats without dividing arms shall have their capacity determined by allowing sixty centimeters (60 cm) per person.

2. Aisles

Every portion of any assembly building which contains seats, tables, displays, equipment, or other materials shall be provided with aisles leading to exit as follows:

- a. When serving more than sixty (60) seats; every aisle shall be not less than nine hundred fifteen millimeters (915 mm) when serving seats on one side only and not less than one hundred twenty-two centimeters (122 cm) when serving seats on both sides. Such minimum width shall be measured at the point farthest from an exit, cross aisles, or foyer and shall be increased in width by two and a half centimeters (2.5 cm) for each meter in length toward the exit, cross aisles, or foyer.
- b. When serving sixty (60) seats or less, aisles shall be not less than seventy six centimeters (76 cm) wide.
- c. Aisles shall terminate in a cross aisle, foyer, or exit. The width of such cross aisle, foyer, or exit shall be not less than the sum of the required width of the widest aisle plus fifty (50%) percent of the total required width of the remaining aisles which it serves.
- d. No dead-end aisle shall be greater than six and one-tenth meters (6.1 m) in length. In arena or thrust stage theaters, dead-end aisles at the stage shall not exceed five rows beyond a cross aisle.
- e. The length of travel to an exit door by any aisle shall be not greater than forty six meters (46 m).
- f. Steps shall not be placed in aisles to overcome differences in level unless the gradient exceeds twelve and a half (12.5%) percent. Steps in aisles shall conform to the requirement for stairs as to rise and tread.
- g. The gradient of sloping aisles shall not exceed twelve and a half (12.5%) percent.

3. Railings

- a. The fasciae of boxes, balconies and galleries shall have substantial railings not less than sixty six centimeters (66 cm) high above the floor.
- b. The railings at the ends of aisles extending to the fasciae shall be not less than seventy six centimeters (76 cm) high for the width of the aisle, or ninety one centimeters (91 cm) high if at foot of steps.
- c. Cross aisles shall be provided with railings not less than sixty-six (66) centimeters high.

I. Lighting and Signs

1. All places of assembly shall have exit lighting in accordance with Section 10.2.5.11 and signs in accordance with Section 10.2.5.12 of this IRR. All places of assembly shall be provided with emergency lighting.
2. In every auditorium or other places of assembly where pictures, motion pictures or other projections are made by means of directed light, the illumination projections are made by means of directed light, the illumination of the floors of exit access may be reduced during such period projection to values of not less than two ten-thousandths (0.0002) lumen per square centimeter.

J. Exits Common to Other Occupancies

1. Places of assembly in building of other occupancy may use exits common to the place of assembly and the other occupancy provided that the assembly area and the other occupancy considered separately each have exits sufficient to meet the requirements of this Chapter.
2. Exits shall be sufficient for simultaneous occupancy of both the place of assembly and other parts of the building.

SECTION 10.2.8.3 STAGE AND ENCLOSED PLATFORM

A. Definitions

1. **Enclosed Platform** – is a partially enclosed portion of an assembly room the ceiling of which is not more than one hundred fifty five centimeters (155 cm) above the proscenium opening of which is designed or used for the presentation of plays, demonstrations, or other entertainment wherein scenery, drops, decorations or other effects may be installed or used.
2. **Stage** – is partially enclosed portion of an assembly building which is designed or used for the presentation of plays, demonstrations, or other entertainment wherein scenery, drops or other effects may be installed or used, and where the distance between the top of the proscenium opening and the ceiling above the stage is more than one hundred fifty two centimeters (152 cm).
3. **Thrust Stage** – is that portion of a stage which projects into the audience on the audience side of a proscenium wall or opening.
4. **Arena stage** – is a stage of platform open on at least three (3) sides to audience seating. It may be with or without overhead scene handling facilities.

5. **Proscenium wall** – is a fire resistive wall which separates a stage or enclosed platform from the public or spectators' area of an auditorium or theater.
- B. Every stage equipped with fly galleries, gridirons, and rigging for movable theater-type scenery, and every enclosed platform larger than forty six and a half square meters (46.5 m^2) in area shall be protected with the automatic fire suppression system at the ceiling, under the gridiron, in usable spaces under the stage or platform and in auxiliary spaces and dressing rooms, storerooms, and workshops.

When opening are provided in the stage floor for stage lifts, trap doors or stairs, automatic fire suppression system shall be provided around the opening at the ceiling below the stage, and baffles at least thirty (30) centimeters in depth shall be installed around the perimeter of the opening.

- C. Every stage and every enclosed platform larger than forty six and a half square meters (46.5 m^2) shall have ventilators in or above it, operable from the stage floor by hand and also opening by fusible links or other approved automatic heat actuated device, or heat and smoke actuated device, to give a free opening equal to at least five (5) percent of the area floor of the stage or enclosed platform. Where mechanical ventilation is provided it shall be so arranged that natural ventilation, at least equal to the above, will be available. Make up air for mechanical ventilation shall not be obtained from the audience (seating) areas.
- D. The proscenium opening of every stage shall be provided with a fire resistant curtain constructed and mounted so as to intercept hot gases, flames, and smoke, and to prevent glow from a severe fire on the stage showing on the auditorium side within a five (5) minute period. The curtain shall be automatic closing without the use of applied power.
- E. Every stage shall be provided with a fire control station located on or adjoining the stage. The fire control station shall have the following:
 1. Lights to indicate the operations of all emergency lights and power circuits.
 2. Manual operating devices to actuate automatic spray heads at proscenium, proscenium curtain, and smoke vents.
 3. Indicator light to show that the automatic fire suppression system is operating, or sprinkler system valves are open and system is charged with water under pressure.
 4. A public address system energized from normal and emergency light and power sources.

5. An alarm system connected to the manager's office, dressing rooms, and auxiliary stage spaces. It shall not sound an alarm audible in the audience or seating portion of the theater.
- F. Auxiliary stage spaces such as under-stage areas, dressing rooms, workshops and similar spaces associated with the functioning of a stage shall comply with the following:
 1. No point within any auxiliary space shall be more than fifteen and one-fourth meters (15.25 m) from a door providing access to an exit.
 2. There shall be at least two (2) exits available from every auxiliary stage space, one of which shall be available within a travel distance of twenty three meters (23 m). A common path of travel of six meters (6 m) to the two (2) exits shall be permitted.
 3. Auxiliary stage spaces shall be protected as provided under this Section.
 4. No workshop involving the use of combustible or flammable paint, liquids, or gases, or their storage shall open directly upon a stage.
- G. Where approved, supervised sprinkler system is not required, the proscenium wall of every theater using movable scenery or decorations shall not have more than two (2) openings entering the stage, exclusive of the proscenium opening. Such opening shall not exceed two square meters (2 m^2) each and shall be fitted with self-closing fire doors.
- H. Each stage shall be equipped with a one and a half inch (38.1 millimeters) wet-standpipe equipped with at least 30 meters hose on -each side of the stage.

SECTION 10.2.8.4 PROJECTION BOOTH

- A. Every place of assembly in which pictures are projected from cellulose acetate, or other safety film using electric arc, xenon, or other light sources, which generate hazardous gases, dust, or radiation, shall have a projection room which complies with Section 10.2.8.17 of this IRR and the following paragraph. This also applies to other latest types of projection (e.g. LCD and i-MAX)
- B. There shall be posted on the outside of each projection room door and within the projection room proper, a conspicuous sign in block letters twenty (25) millimeters stroke stating: "Safety Film Only Permitted in This Room."

SECTION 10.2.8.5 DECORATIVE MATERIAL

- A. No decorative material, which will ignite and allow flame to spread over the surface when exposed to a flame test shall be allowed to be used in places of assembly.
- B. The method of test shall be as follows: the piece shall be exposed to the flame from a common match and held in horizontal position twelve and seven-tenths (12.7) millimeters underneath the piece, and a constant location for a minimum of fifteen (15) seconds.
- C. Treatments may be applied to decorative material to accomplish flame proofing. Such treatments shall be renewed as often as may be necessary to maintain the flame-proofed condition of the material.

SECTION 10.2.8.6 PYROXYLIN COATED FABRIC

Use of pyroxylin coated fabrics inside places of assembly shall be restricted as follows:

- A. The nitrocellulose coating shall not exceed four hundred thirty (430) grams for every square meter of fabric.
- B. The total surface area of fabric-complying with paragraph "A" above shall not exceed one (1) square meter for every four and a half (4.5) cubic meter of room volume.
- C. Where the coating exceeds forty seven (47) grams per square meter, the total area of such fabric shall not exceed one (1) square meter for every two and one-fourth (2.25) cubic meter of room volume.

SECTION 10.2.8.7 MOTION PICTURE SCREENS, STAGE CURTAINS AND DRAPES

No motion picture screens or screen masking curtains, bunting or other draperies shall be used unless the material is flame-proofed and will pass the match-flame test described in Section 10.2.8.5 of this IRR.

SECTION 10.2.8.8 PROTECTION

A. Protection of Vertical Opening

Any vertical opening shall be enclosed or protected in accordance with Section 10.2.5.2 of this IRR.

B. Interior Finish

1. The interior finish requirements of this Section shall be in accordance with Section 10.2.6.3 of this IRR and subject to modifications specified therein.

2. Interior finish in all means of egress in all places of assembly shall be Class A.
3. Interior finish in general assembly areas shall be Class A.
4. Screen on which pictures are projected shall comply with requirements of Class A or Class B interior finish, as the case maybe.

C. Protection from Hazards

Rooms or spaces used for hazardous equipment, operations and process, such as but not limited to rooms containing high -pressure vessels, refrigerating machineries, large transformers, or other service equipment; rooms or spaces used for the storage, processing or use of boilers or furnaces, combustible supplies, hazardous materials or flammable or combustible liquids; laundries; and maintenance shops including woodworking and painting areas; shall not be directly located under or abutting required exits and shall be separated from other parts of the building by fire barriers by construction of not less than 1 hour fire resistance rating.

D. Fire Detection and Alarm System

1. All assembly occupancies shall be provided with fire alarm system with manual initiation, provided, however that where occupants of the building exceed 300 persons, the initiation shall be through an automatic detection system.
2. The required fire alarm system shall activate an audible and visible alarm in a constantly attended receiving station within the building when occupied for purposes of initiating emergency action.

E. Extinguishing Requirement

1. The following assembly occupancies shall be protected throughout by an approved, supervised automatic sprinkler system:
 - a. bars with live entertainment;
 - b. dance halls;
 - c. discotheques; and
 - d. assembly occupancies with festival seating.
2. Buildings containing assembly occupancies with occupant loads of more than 300 shall be protected by an approved, supervised automatic sprinkler system:

- a. throughout the storey containing the assembly occupancy;
- b. throughout all storeys below the storey containing the assembly occupancy;
- c. in case of an assembly occupancy located below the level of exit discharge, throughout all storeys intervening between that storey and the level of exit discharge, including the level of exit discharge.

3. The provisions of para "E" (1) and (2) above shall not apply to assembly occupancies consisting of single multipurpose room of less than 1115 square meters that are not used for exhibition or display and are not part of a mixed occupancy, all assembly occupancy with all sides open and places of worship at the level of exit discharge with sufficient means of egress.

SECTION 10.2.8.9 BUILDING SERVICE EQUIPMENT

A. Elevators

Elevators shall not constitute required means of exit. When places of assembly are more than three (3) storeys above ground level and equipped with automatic elevators, at least one elevator shall be designed and equipped for fire emergency use by members of the BFP, or as may be determined by the City/Municipal Fire Marshal. Key operation shall transfer automatic elevator operation to manual and bring elevator to ground or first floor use by said members. The elevator shall be situated so as to be readily accessible.

B. Air Conditioning

All air conditioning, heating, and ventilation installations shall comply with the provisions of Division 7 of this Chapter.

C. Special Provisions for Food Service Establishments

1. All devices in connection with the preparation of food shall be installed and operated to avoid hazard to the safety of occupants and shall be installed and maintained in accordance with good engineering practice.
2. Cooking equipment shall be protected by automatic kitchen hood fire suppression in accordance with NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.

SECTION 10.2.8.10 PLAN OF EXIT WAYS AISLES

- A. A plan showing the capacity and location of the exit ways and aisles thereto shall be submitted for approval by the City/Municipal Fire Marshal,

and approved copy of such plan shall be kept prominently on display in the premises.

- B. In all theaters, nightclubs, dance halls and similar occupancies, an audible announcement and other means of announcement shall be made prior to the performance describing the location of exits to be used in case of fire or other emergencies.

SECTION 10.2.8.11 OVERCROWDING

No person shall permit the overcrowding or admittance of any person beyond the approved capacity of any place of public assemblage. The City/Municipal Fire Marshal, upon finding any overcrowding condition or obstruction in aisles, passageways or other means of egress; or upon finding any condition which constitutes a serious menace of life, shall cause the performance, presentation, or entertainment to be stopped until the condition or obstruction is corrected.

SECTION 10.2.8.12 STANDBY FIREMEN

- A. The City/Municipal Fire Marshal having jurisdiction whenever in his judgment, it is essential for public safety to deploy standby firemen in any place of public assembly, or any other place where people congregate, due to the number of persons, or the nature of the performance, exhibition, display contest or activity, is authorized to detail standby firemen at such place.
- B. The said firemen shall be in uniform and remain on duty during the time such places are open to the public, or when the activity is being conducted. Before each performance or the start of the activity, the said firemen shall inspect the required fire appliances provided, to see that they are in proper place and in good working order, and shall keep diligent watch for fires during the time such place is open to the public or such activity is being conducted and take prompt measures for the extinguishment of fire that may occur.

SECTION 10.2.8.13 OUTDOOR ASSEMBLY

- A. All grandstands, tents, and other places of outdoor assembly shall comply with the requirements of NFPA Pamphlet No. 102, "Standards for Tents, Grandstands, and Air-Supported Structures used for Public Assembly".
- B. Grandstand and bleacher type seating may be used as indoor type seating only when it meets with the requirements of this Division.

SECTION 10.2.8.14 UNDERGROUND STRUCTURE AND WINDOWLESS BUILDINGS

The requirements of underground structures and windowless buildings used as places of assembly shall be in accordance with Division 17 of this Chapter.

SECTION 10.2.8.15 SPECIAL PROVISIONS FOR EXHIBITIONS HALLS

- A. No display or exhibit shall be so installed or operated as to interfere in any way with access to any required exit or with visibility of any required exit or of any required exit sign, nor shall any display block access to fire fighting equipment.
- B. All displays or exhibits of combustible material or construction and all booths and temporary construction in connection therewith shall be so limited in combustibility or protected as to avoid any undue hazard of fire which might endanger occupants before they have opportunity to use available exits.
- C. Any place of assembly used for exhibition or display purposes shall be equipped with a complete automatic fire suppression system, when the exhibition or display area exceeds one thousand three hundred ninety four square meters (1394 m^2). For combustible materials not on display, storage room having an enclosure with a fire resistance rating of at least two (2) hours and protected by an automatic fire extinguishing system shall be provided.

SECTION 10.2.8.16 EXISTING PLACES OF ASSEMBLY

A. Capacity Limitations

In existing places of assembly, the Chief, BFP or his duly authorized representative may permit occupancy by number of persons not to exceed that for which the existing exits are adequate provided that measures are established satisfactory to the Chief, BFP or his duly authorized representative to prevent occupancy by any greater number of persons based on the calculated occupant load of the building.

B. INTERIOR FINISH

Provisions of Section 10.2.6.3 of this IRR shall apply in existing places of assembly where interior finish does not conform to the requirements for new assembly buildings.

SECTION 10.2.8.17 PROJECTION ROOMS FOR SAFETY FILM

- A. Every projection room shall be of permanent construction consistent with the construction requirements for the Type of building in which the projection room is located. The room shall have a floor area of not less than seven and four-tenths square meters (7.4 m^2) for a single machine and at least three and three-fourths square meters (3.75 m^2) for each additional machine. Each motion picture projector, floodlight, spotlight, or similar piece of equipment shall have a clear working space not less than two and one-fourth square meters (2.25 m^2).

- B. Each projection room shall be at least one out-swinging, self-closing door not less than seventy six centimeters (76 cm) wide by two meters (2 m) high.
- C. The aggregate of ports and openings for projection equipment shall not exceed twenty-five percent (25%) of the area of the wall between the projection room and the auditorium. All opening shall be provided with glass or other approved materials, so as to completely close the opening.
- D. Projection booth room ventilation shall be not less than the following:

1. Supply Air

Each projection room shall be provided with two or more separate fresh air inlet ducts with screened openings terminating within thirty centimeters (30 cm) of the floor, and located at opposite ends of the room. Such air inlets shall be of sufficient size to permit an air change every three minutes. Fresh air may be supplied from the general building air conditioning system, providing it is so arranged that the projection booth will continue to receive one change of air every three (3) minutes, when no other air is supplied by the general air conditioning system.

2. Exhaust Air

Each projection room shall be provided with one or more exhaust air outlets which may be manifold into a single duct outside the booth. Such outlets shall be so located as to ensure circulation throughout the room. Projection room exhaust air system shall be independent of any other air systems in the buildings. Exhaust air ducts shall terminate at the exterior of the building in such a location that the exhaust system shall be mechanically operated and of such a capacity as to provide a minimum of one change of air every three minutes. The blower motor shall be outside the duct system. The projection room ventilation system may also appurtenant rooms, such as the generator room and the rewind room.

- E. Each projection machine shall be provided with an exhaust duct which will draw air from each lamp and exhaust it directly to the outside of the building in such a fashion that it will not be picked up by supply inlets. Such a duct shall be of rigid materials, except for a continuous flexible connector approved for the purpose. The lamp exhaust systems shall not be interconnected with any other system.

1. Electric Arc Projection Equipment

The exhaust capacity shall be five and two-thirds cubic meters (5.66 m³) per minute for each lamp connected to the lamp exhaust system

or as recommended by the equipment manufacturer, whichever is greater. Auxiliary air may be introduced into the system through a screened opening to stabilize the arc.

2. Xenon Projection Equipment

The lamp exhaust shall exhaust not less than eight and one-half (8.5) cubic meters per minute per lamp, nor less than that exhaust volume required or recommended by the equipment manufacturer, whichever is greater. The external temperature of the lamp housing shall not exceed fifty four and one-half (54.5°C) degrees Celsius when operating.

- F. Each projection room shall be provided with rewind and film storage facilities.
- G. A maximum of four (4) containers for flammable liquids not greater than one-half liter (0.5l) capacity and of a non-breakable type may be permitted in each projection booth.
- H. Appurtenant electrical equipment such as rheostats, transformers, and generators may be located within the booth or in a separate room of equivalent fire resistance construction.

SECTION 10.2.8.18 OPEN FLAME

No person shall cause or permit any open flame to be used in any place of public assemblage, or drinking or eating establishments, except when used in conjunction with approved heating or cooking appliances or under a written permit from the City/Municipal Fire Marshal having jurisdiction.

DIVISION 9. EDUCATIONAL OCCUPANCIES

SECTION 10.2.9.1 OCCUPANCY AND OCCUPANT LOAD

A. Classification of Educational Occupancies

- 1. Educational occupancies shall include all buildings used for the gathering of groups of six (6) or more persons for purposes of instruction, such as schools, universities, colleges, and academies.
- 2. Educational occupancy includes part-day, nursery schools, kindergartens, day care facilities, and other schools whose purpose is primarily educational even though the children are of pre-school age.
- 3. Other occupancies associated with educational institutions shall be in accordance with the appropriate parts of this Chapter.
- 4. In cases where instruction is incidental to some other occupancy the

Section of the Chapter governing such other occupancy shall apply.

B. Occupant Load

1. The occupant load of educational buildings or any individual storey or section thereof for the purpose of determining exits shall not be less than one person for each one and nine -tenths square meters (1.9 m^2) of net classroom area or four and six-tenths (4.6) square meters of net area of shops, laboratories, and similar vocational rooms. In dry nurseries where sleeping facilities are provided, the occupant load shall be not less than one person for each three and three tenths square meters (3.3 m^2).
2. The occupant load of an area having fixed seats shall be determined by the number of fixed seats installed. Required aisle space serving the fixed seats shall not be used to increase the occupant load.
3. The occupant load of individual lecture rooms, gymnasiums, or cafeterias used for assembly purposes of more than fifty (50) persons shall be determined in accordance with Section 10.2.8.1 of this IRR.

SECTION 10.2.9.2 EXIT DETAILS

A. Capacity of Exits

Capacity of means of egress shall be in accordance with Section 10.2.5.2 para "C" of this IRR.

B. Minimum Number of Exits

1. Every room or space with a capacity of fifty (50) or more persons or over ninety three square meters (93 m^2) in area shall have at least two (2) doorways as remote from each other as practicable. Such doorways shall provide access to separate exits, but, where egress is through corridors, shall open upon a common corridor leading to separate exits in opposite directions.
2. Not less than two separate exits shall be provided on every storey and accessible from every part of every storey and mezzanine.

C. Travel Distance to Exits

Travel distance to an exit from any point in a building without an approved, supervised automatic sprinkler system shall not exceed forty six meters (46 m), and shall not exceed sixty one meters (61 m) in any building protected throughout by an approved, supervised automatic sprinkler system.

D. Access to Exits

1. Every aisle, corridor, balcony, other means of access to exits, and discharge from exit shall be in accordance with Section 10.2.5.2 of this IRR.
2. Any corridor shall be not less than one and eighty-three tenths meters (1.83 m) wide in the clear.
3. Doors which swing into an exit access corridor shall be recessed to prevent interference with corridor traffic; any doors not so recessed shall open the one hundred eighty degrees (180°) to stop against the wall. Doors in any position shall not reduce the required corridor width by more than one half.
4. Drinking fountains or other equipment, fixed or movable shall not be so placed as to obstruct the required minimum 1.83 meters corridor width.

E. Exterior Corridors or Balconies

1. Where exterior corridors or balconies are provided as means of exit, they shall open to the outside air except for railings or balustrades with stairs or level exits to grade not over seventy six and one-fourth meters (76.25 m) apart, so located that an exit will be available in either direction from the door to any individual room or space, with dead ends not to exceed six meters (6 m). If balconies are enclosed by glass or in any other manner, they shall be treated as interior corridors.
2. The floors of balconies (exterior corridors) and stairs shall be solid, without openings, and shall comply with requirements for outside stairs as regards balustrades or railings, width and pitch of stairs, and other details, but are not required to be shielded from fire within the building by blank walls, wired glass windows or the like where the stairs are located on the side of balcony or corridor away from the building and are separated from the building by the full width of the balcony or corridor.

F. Exit Arrangement

1. Exits shall be so arranged that at least two (2) separate exits will be available from every floor area. Exits shall be as remote from each other as practicable, so arranged that there will be no pockets or dead ends in which occupants may be trapped, and in no case shall any dead-end corridor extend more than six meters (6 m) beyond the stairway or other means of exit therefrom.
2. Every classroom or room used for educational purposes or student

occupancy below the floor of exit discharge shall have access to at least one (1) exit which leads directly to the exterior at level of discharge without entering the floor above.

G. Types of Exits

1. Exits of the specified number and width shall be of one or more of the following types, in accordance with the provisions of Division 5 of this Chapter.
 - a. Doors of the swinging type leading directly outside or through a lobby or passageway leading to the outside of the building. Any exterior door and any room door subject to use by fifty (50) or more persons shall be operated by bars or other panic hardware device with re – entry mechanism, in accordance with Section 10.2.5.3 of this IRR, except that a door leading directly to the outside from a classroom occupied by less than 50 persons may be equipped with the same knob-operated schoolhouse type lock as is used on classroom doors leading to corridor, with no provision whatsoever for locking against egress from the classroom.
 - b. Horizontal exits
 - c. Smokeproof enclosures
 - d. Stairs
 - e. Ramps

H. Additional Exit Details

The provisions of this Section are based on occupancy by normal individuals. Educational buildings used by persons with physical or mental handicaps shall have additional features as may be required by the Chief, BFP or his duly authorized representative to ensure safe use of such exits in an emergency.

SECTION 10.2.9.3 LIGHTING AND SIGNS

- A. All educational buildings shall have adequate exit illumination in accordance with Section 10.2.5.11 of this IRR. Flexible plan and open plan buildings and buildings designed for night occupancy and portions of buildings having interior and windowless rooms, areas, and corridors, shall have emergency lighting.
- B. All educational buildings shall have signs designating the location of exits or the path of travel to reach them, in accordance with Section 10.2.5.12 of this IRR.

SECTION 10.2.9.4 WINDOWS FOR RESCUE AND VENTILATION

- A. Except in buildings with protected with approved, supervised sprinkler system in accordance with Section 10.2.6.5 of this IRR, every room or space used for classroom or other educational purposes or normally subject to student occupancy, unless it has a door leading directly to the outside of building, shall have at least one outside window which can readily be used for emergency rescue or ventilation purposes, and which meets all of the following provisions:
 1. It can readily be opened from the inside without the use of tools.
 2. It provides a clear opening with a minimum dimension of 560 mm in width and 800 mm in height.
 3. The bottom of window opening is not more than eighty two (82) centimeters above the floor; and
 4. Where storm windows, screens, or anti-burglar devices are used, these shall be provided with quick opening mechanism so that they may be readily opened from the inside for emergency egress and shall be so arranged that when opened they will not drop to the ground.

SECTION 10.2.9.5 PROTECTION

A. Vertical Opening

Any interior stairways and other vertical openings in educational buildings shall be enclosed and protected in accordance with Section 10.2.5.2 of this IRR, except when it serves only one adjacent floor other than a basement, it is not connected to other stairway serving other floors and it is not connected with corridors or stairways serving other floors.

B. Interior Corridors

1. Every interior corridor shall be of construction having not less than a one-half fire resistance rating, and all openings therein protected accordingly. Room doors may be forty four (44) millimeters solid bonded core wood doors or the equivalent. Such corridor protection shall not be required when all classrooms served by such corridors have at least one door directly to the outside or to an exterior balcony or corridor as in Section 10.2.9.2 of this IRR.
2. Any interior corridor more than ninety one (91) meters in length shall be divided into sections not to exceed ninety one (91) meters in length by smoke partitions installed in accordance with Section 10.2.6.7 of this IRR.

C. Interior Finish

Interior finish shall be Class A in corridors, stairways and other means of egress and may be Class B or Class C elsewhere, in accordance with the provisions of Section 10.2.6.3 of this IRR.

D. Fire Alarm System

1. Approved fire alarm facilities capable of being manually operated in accordance with Section 10.2.6.4 of this IRR shall be provided in every educational building.
2. In building provided with automatic fire suppression system the operation of the system shall automatically actuate electrical school fire alarm system.

E. Automatic Fire Suppression System

Every portion of educational buildings below the floor of exit discharge shall be protected with complete automatic sprinkler protection in accordance with Section 10.2.6.5 of this IRR.

F. Hazardous Areas

An area used for general storage, boiler or furnace rooms, fuel storage, janitors closets, maintenance shops including woodworking and painting areas, laundries and kitchen shall be separated from other parts of the building with construction having not less than a one-hour fire resistance rating, and all openings shall be protected with self-closing fire doors, or such area shall be provided with automatic fire suppression system. Where the hazard is high as determined by the Chief, BFP or his duly authorized representative, both the fire resistive separation and automatic fire suppression system shall be provided.

G. Cooking equipment

Cooking equipment shall be protected by automatic kitchen hood fire suppression in accordance with NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.

SECTION 10.2.9.6 BUILDING SERVICE EQUIPMENT

A. Elevators

1. An elevator shall not constitute required means of exit.
2. When an educational occupancy is more than three (3) storeys and equipped with automatic elevators, one or more elevators shall be designed and equipped for fire emergency use by firefighters, as

specified in Section 10.2.7.5 of this IRR. Key operation shall transfer automatic elevator operation to manual and bring elevator to ground or first floor for use of firefighters. The elevator shall be situated so as to be readily accessible. If the building is equipped with only one elevator, the same shall be equipped with firefighter's switch to be capable of being manually operated.

B. Air conditioning

Every air-conditioning, heating, and ventilating installation shall comply with Division 7 of this Chapter.

C. Electrical Wiring and Equipment

Electrical wiring and equipment shall be in accordance with provisions of the Philippine Electrical Code, and all cooking, heating, incinerating and other building service equipment shall be installed in accordance with Division 7 of this Chapter.

SECTION 10.2.9.7 SPECIAL PROVISIONS FOR FLEXIBLE PLAN AND OPEN PLAN BUILDINGS

A. Definitions

1. Flexible plan and open plan educational buildings or portion of a building not having corridors which comply with Section 10.2.9.1 of this IRR and are designed for multiple teaching stations.
 - a. Flexible plan buildings have movable corridor walls and movable partitions of full height construction with doors leading from rooms to corridors. Flexible plan buildings without exit access doors between rooms and corridors shall be classified as open plan buildings.
 - b. Open plan buildings have rooms and corridors delineated by use of tables, chairs, desks, bookcases, counters, low height partitions, or similar furnishings.
2. **Common Atmosphere** – a common atmosphere exists between rooms, spaces or area within a building, which are not separated by an approved smoke partition.
3. **Separate Atmosphere** – a separate atmosphere exists between rooms, spaces area, that are separated by an approved smoke partition.
4. **Smoke Partition** – (See Section 10.2.6.9). For purposes of this Section, smoke partitions shall also include floors and openings therein.
5. **Room** – for the purpose of this Section, a room is a space or area

bounded by an obstruction to egress which at any time enclose more than eighty (80%) percent of the perimeter of the space or area. Openings of less than two (2) meters high shall not be considered in computing the unobstructed perimeter.

6. **Interior Room** – a room whose only means of egress is through an adjoining or intervening room which is not an exit.
7. **Separate Means of Egress** – a means of egress separated in such a manner from other means of egress as to provide an atmosphere separation which preclude contamination of both means of egress by the same fire. (See Section 10.2.6.7 of this IRR).

B. Area Limitations and Separations

1. Flexible plan and open plan buildings shall not exceed two thousand seven hundred eighty seven square meters ($2,787 \text{ m}^2$) in undivided area. A solid wall or smoke partition (Section 10.2.6.7 of this IRR) shall be provided at maximum intervals of ninety one (91) meters and openings in such walls or partition shall comply with Section 10.2.6.7 of this IRR.
2. Vertical openings shall be enclosed as required by Section 10.2.9.1 of this IRR.
3. Stages in places of assembly shall be separated from school areas by construction of non-combustible materials having at least a two-hour fire resistance rating and shall comply with Section 10.2.8.1 of this IRR.
4. Shops, laboratories, and similar vocational rooms, as well as storage rooms, shall be separated from school areas by construction having at least a one-hour fire resistance rating, they shall have exits independent from other areas.

C. General Provisions

1. The specific requirements of this Section are not intended to prevent the design or use of other systems, equipment or techniques which will effectively prevent the products of combustion from breaching the atmospheric separation.
2. The provisions of this subsection shall apply only to the requirements for providing separate atmosphere. The fire resistance requirements shall comply with other provisions of this Chapter.
 - a. Walls, partitions and floors forming all of or part of an atmospheric separation shall be of materials consistent with the requirements for the type of construction, but of construction not less effective than

a smoke partition. Openings in walls or partition, used to allow the passage of light shall be wired glass set in metal frames.

- b. Every door opening therein shall be protected with a fire assembly as required in this Chapter, but not less than a self-closing or automatic closing, tight-fitting smoke assembly having a fire-protection rating of not less than twenty (20) minutes.
- c. Ducts penetrating atmospheric separation walls, partitions or floors, shall be equipped with an approved automatic-closing smoke damper when having openings into more than one atmosphere or atmospheric separation shall be maintained by an approved method of smoke control.
- d. All automatic-closing fire assemblies installed in the atmospheric separation shall be activated by approved smoke detectors.
- e. Janitor closets and storage rooms shall be enclosed by materials having one-hour fire resistance. Stages and enclosed platform shall be constructed in accordance with Division 8.

D. Means of Egress

1. Each room occupied by more than three hundred (300) persons shall have one of its exit access through a separate means of egress. Where three (3) or more means of egress are required, not more than two (2) of them shall enter into the same means of egress.
2. Means of egress from interior rooms may pass through an adjoining or in intervening room, provided that the travel distance do not exceed those set forth in the succeeding paragraph entitled Travel Distance of Exit. Foyers and lobbies constructed as required for corridors shall not be construed as intervening rooms. Where the only means of egress from a room is through an adjoining or intervening room, smoke detectors shall be installed in the area of common atmosphere through which the means of egress must pass. The detectors shall actuate alarms audible in the interior room and shall be connected to the school fire alarm system.

E. Travel Distance to Exits

No point in a building shall be more than forty six (46) meters from an exit, measured in accordance with Section 10.2.5.2 of this IRR.

F. Interior Finish

Interior finish in flexible plan and open plan buildings shall be as follows:

1. Corridors in flexible plan buildings

Class A on rigid material which will not deform at temperature below two hundred thirty two degrees Celsius (232°C).

2. Other than corridor walls

Class A and Class B throughout except that fixtures and low height partitions may be Class C. In one-storey buildings the exposed portions of structural members complying with the requirements for heavy timber construction may be permitted. (See also Section 10.2.6.3 of this IRR).

G. Variable Plans

1. Flexible plan schools may have walls and partitions rearranged periodically, only after revised plans or diagrams have been approved by the City/Municipal Fire Marshal.
2. Open plan schools shall have furniture, fixtures, or low height partitions so arranged that exits be clearly visible and unobstructed, and exit paths are direct, not circuitous. If paths or corridors are established, they shall be at least as wide as required by Section 10.2.9.1 of this IRR.

H. Sprinkler Systems

1. Any flexible plan building or open plan building in which the travel distance to exits exceeds forty six (46) meters shall have approved, supervised sprinkler systems in accordance with Section 10.2.6.5 of this IRR. Such systems shall be electrically interconnected with the school fire alarm system.
2. Automatic fire suppression systems shall be modified to conform with partition changes. Modification plans shall have prior approval of the City/Municipal Fire Marshal.

SECTION 10.2.9.8 SPECIAL PROVISIONS FOR PRE-SCHOOLS

Rooms used for pre-schoolers, first grade and second grade pupils shall not be located above or below the floor of exit discharge.

SECTION 10.2.9.9 UNDERGROUND AND WINDOWLESS EDUCATIONAL BUILDINGS

The provisions of Section 10.2.17.4 of this IRR shall apply to Underground and Windowless Educational Buildings and such buildings shall be provided completely with automatic fire suppression system.

SECTION 10.2.9.10 SPECIAL PROVISIONS FOR COMBINED OCCUPANCIES

A. Assembly and Educational

Any auditorium, assembly room, cafeteria, gymnasium used for assembly purposes such as athletic events with provisions for seating of spectators, or other spaces subject to assembly occupancy shall comply with Division 8 which provided that where auditorium and gymnasium exits lead through corridors stairways also serving as exits for other parts of the building, the exit capacity shall be sufficient to permit simultaneous exit from auditorium and classroom sections.

B. Dormitory and Classroom

Any building used for both classroom and dormitory purposes shall comply with the applicable provisions of Division 12 in addition to complying with Division 9 of this Chapter. Where Classroom and dormitory sections are not subject to simultaneous occupancy, the same exit capacity may serve both sections.

C. Other Combined Occupancies

Any other combinations of occupancy not covered in this Section shall comply with all applicable Divisions of this Chapter, with exits adequate to serve all occupancies simultaneously.

SECTION 10.2.9.11 EXISTING EDUCATIONAL BUILDINGS

A. General

An existing building being used for educational occupancies established prior to the effective date of this Fire Code may have its use continued if it conforms or is made to conform to the provisions of this Rule to the extent that, in the opinion of the City/Municipal Fire Marshal having jurisdiction, reasonable life safety against the hazards of fire, explosion, and panic is provided and maintained subject to the provisions of para "B" through "E" below.

B. Additional Protection

The provision of additional means of egress, automatic fire suppression system, area separations, emergency lighting, and other alternate means of protection may be used to provide reasonable life safety from fire and panic.

C. Exits

1. Exit deficiency may be corrected by adding additional exits, preferably those which will provide direct exit to the outside from classroom or student-occupied areas.
2. In lieu of direct exit to the outside from classrooms, additional life safety may be afforded by the provisions of communicating doors between classroom or student-occupied areas to provide access to at least one (1) exit stair without passing through interior corridors.

D. Interior Finish

In existing educational buildings which have interior finish that do not comply with the requirements for new buildings, the provisions of Section 10.2.6.3 of this IRR shall be acceptable as alternate requirements.

E. Fire Alarm Systems

Requirements for Fire Alarm System for existing educational buildings shall conform to those for new educational buildings.

SECTION 10.2.9.12 CHILD DAY CARE CENTERS

A. General

1. Application

- a. This Section establishes life safety requirements for child day care centers, in children receive care, maintenance and supervision for twenty-four (24) hours or less per day.
- b. For the purposes of this section, children are classified in age groups, as follow: Children under three (3) years of age, children from three (3) through five (5) years of age, and children six (6) years of age and older.
- c. The text principally applies to centers for children under three (3) years of age. Variation for centers housing children three (3) years of age and older are indicated.
- d. Centers housing children six (6) years of age and older shall conform to the requirements for educational occupancies.
- e. Where a facility houses more than one age group, the requirements for the younger children shall apply, unless the area housing the younger children is maintained as a separate fire area.
- f. Where centers are located in a building containing mixed

occupancies the separation requirements of the Building Code shall be satisfied.

2. Occupant Load

The occupant load for which means of egress shall be provided to any floor shall be the maximum number of persons intended to occupy that floor but not less than one person for each three and three tenths square meters (3.3 m^2) of net floor area used by the children.

B. Exit Details

1. Number

- a. The storey below the floor of exit discharge may be used in buildings of fire-resistive construction, protected non-combustible construction, protected wood frame construction and protected ordinary construction, if the following conditions are met:
 - i. For up to thirty (30) children there shall be two (2) remote exits. One exit shall discharge directly outside and the vertical travel to ground level shall not exceed two hundred forty four centimeters (244 cm). There shall be no unprotected opening into the enclosure of the second exit.
 - ii. For over thirty (30) children a minimum of two (2) exits shall be provided directly outside with one of the two (2) exiting at ground level.

2. Access to Exits

- a. Travel distance between any room or intended as exit access and an exit shall not exceed thirty and a half meters (30.50 m);
- b. Travel distance between any point in a room and an exit shall not exceed forty five and eight-tenths meters (45.80m);
- c. Travel distance between any point in a sleeping room or suite shall not exceed fifteen and one fourth meters (15.25 m).
- d. The travel distance in (a) and (b) above may be increased by fifteen and one fourth meters (15.25 m) in building completely equipped with an approved, supervised sprinkler system.
- e. Travel distance shall be measured in accordance with Section 10.2.5.2 of this IRR.

3. Doors

- a. Doors in means of egress shall swing in the direction of exit travel and shall meet the requirements of Section 10.2.9.2 of this IRR.
- b. Every closet door latch shall be such that children can open the door from inside the closet.
- c. Every bathroom door lock shall be designed to permit opening of the locked door from the outside in an emergency, and the opening device shall be readily accessible to the staff.

4. Stairs

- a. Exit stairs shall be enclosed in accordance with Section 10.2.6.2 of this IRR
- b. There shall be no enclosed usable space under stairs in an exit enclosure nor shall the open space under such stairs be used for any purpose.

5. Areas of Refuge

In building over five (5) storeys above ground level, areas of refuge shall be provided for occupants of child day care centers, either by smokeproof enclosures or horizontal exits.

6. Emergency Lighting

Means of egress in each day care center shall be provided with emergency lighting, in accordance with Section 10.2.5.11 of this IRR.

C. Protection

1. Centers Housing Children

- a. Sleeping areas in centers housing children under three (3) years of age shall be compartmentalized with partitions having a one (1) hour fire resistance rating so there are not more than six (6) children in each compartment.
- b. Compartment doors shall be not less than ninety one centimeters (91 cm) in new construction and not less than eighty one and one-fourth centimeters (81.25 cm) wide in existing building. Door assemblies shall have a twenty-minute (20) fire protection rating and shall be equipped with a self-closing device, a latch and an automatic hold-open device as specified in Section 10.2.5.3 of this IRR.

2. Centers in Apartment Buildings

- a. If the two (2) exit access from the center the same corridor as in an apartment building, the exit access shall be separated in the corridor by a smoke partition having not less than one-hour fire resistance rating. The smoke partition shall be so located that there is an exit on each side of it.
- b. The door in the smoke partition shall be not less than ninety one centimeters (91 cm) wide.
- c. The door assembly shall have a fire protection rating of at least twenty (20) minutes and shall be equipped with self-closing device, a latch and an automatic hold-open device as specified in Section 10.2.5.3 of this IRR.

3. Minimum Construction Standards

Centers shall not be located above the heights indicated for the types of construction given in Table 12:

Table 12: NUMBER OF STAIRS PER TYPE OF CONSTRUCTION BY AGE GROUP

Type of Construction	Age group	Number of Stairs (Storeys are counted starting at floor of exit discharge)			
		1	2	3	4 and over
Fire Resistive and Protected Non-combustible	0 to 3	X	X	X	X
	3 to 5	X	X	X	X
	6 & older	X	X	X	X
Protected Wood Frame and Protected Ordinary	0 to 3	X	See Note 1	1	Not permitted
	3 to 5	X	See Note 1	X	See Note 1
	6 & older	X	See Note 1	X	See Note 1
Heavy Timber	0 to 3	X	See Note 1		
	3 to 5	X	See Note 1		
	6 & older	X	See Note 1		
Unprotected Non-combustible	0 to 3	X	See Note 1		
	3 to 5	X	See Note 1		
	6 & older	X	See Note 1		
	0 to 3		Not permitted		
	3 to 5		See Note 1		
	6 & older		See Note 2		

Note 1. Permitted if entire building is equipped with an automatic fire suppression system.

Note 2. May be permitted for children three (3) years of age and older if the children are limited to the first floor and number of children to fifty (50) and there are two (2) remote exits; or if they are limited to the first floor and the number of children is limited to one hundred (100) and each room has an exit directly to the outside.

4. Protection of Vertical Openings

Any vertical opening in centers shall be enclosed and protected in accordance with Section 10.2.6.2 of this IRR.

5. Interior Finish

- a. In centers for children five (5) years old or less, interior finish for all walls and ceilings shall be Class A or Class B in accordance with Section 10.2.6.3 of this IRR and floors shall be Class A, B or C.
- b. In centers for children more than five (5) years of age, interior finish for means of egress shall be Class A or Class B for individual rooms. Floors shall be Class A, B, or C.
- c. Decorations and furnishing shall be in accordance with Section 10.2.18.1 of this IRR.

6. Extinguishing and Alarm Systems

- a. Smoke and/or heat detectors shall be installed on the ceiling of each storey in front of the doors to the stairways and at no greater than nine meters (9 m) spacing in the corridors of all floors containing the centers. Detectors shall also be installed in lounges and recreation areas in centers. The detectors may be single station unit with an integral local alarm having a decibel rating of at least 85, and shall be electrically connected to the centralized fire alarm system.
- b. There shall be manually operated switch for the fire alarm system on each floor of the center. In centers with more than one hundred (100) children, the fire alarm system shall be installed to transmit an alarm by the most direct and reliable method.
- c. Portable fire extinguishers, suitable for Class B fires shall be installed in kitchens and cooking areas and extinguishers suitable for Class A fires shall be installed throughout the remainder of the center. (See Section 10.2.6.5 of this IRR).
- d. Standpipes shall be installed in all buildings of four (4) storeys or more housing child day care centers.

7. Hazardous Areas

An area used for general storage, boiler or furnace rooms, fuel storage, janitor's closets, maintenance shops including woodworking and painting areas, laundries and kitchens shall be separated from other parts of the building with construction having not less than a one-hour fire resistance rating and all openings shall be protected with self-closing fire doors, or such area shall be provided with automatic fire suppression system. Where the hazard is high as determined by the Chief, BFP or his duly authorized representative, both the fire-resistive separation and automatic fire suppression systems shall be provided.

D. Center Service Equipment

1. Air Conditioning, Ventilation, Heating, Cooking and other Service Equipment

Airconditioning, ventilating, heating, cooking and other service equipment shall be in accordance with Division 7 of this Chapter.

2. Electrical Services

a. Electrical wiring in new construction shall be installed in accordance with the provision of the Philippine Electrical Code.

b. Receptacles and outlets services by extension cord type wiring are prohibited. Electrical appliances shall be grounded.

c. Special protective receptacle covers shall be installed in all areas occupied by children in centers for children under five (5) years of age.

DIVISION 10. HEALTH CARE OCCUPANCIES

SECTION 10.2.10.1 GENERAL REQUIREMENTS

A. Definitions

1. Hospitals

A building or part thereof used for the medical, psychiatric, obstetrical or surgical care, on a 24-hour basis, of four (4) or more inpatients. Hospitals, wherever used in this Chapter, shall include general hospitals, mental hospitals, tuberculosis hospitals, children's hospitals, and any such facilities providing inpatient care.

2. Nursing Home

A building or part thereof used for the lodging, boarding and nursing care, on a 24-hour basis, of four (4) more persons who, because of

mental or physical incapacity, maybe unable to provide for their own needs and safety without the assistance of another person. Nursing home, wherever used in this IRR, shall include nursing and convalescent homes, skilled nursing facilities, intermediate care facilities, and infirmaries of homes for the aged.

3. Residential-Custodial Care Facility

A building, or part thereof, used for the lodging or boarding of four (4) or more persons who are incapable of self-preservation because of age, or physical or mental limitation. This includes facilities such as homes for the aged, nurseries (custodial care for children under six (6) years of age), and mentally retarded care institutions. Day care facilities that do not provide lodging or boarding for institutional occupants are not covered in this Division.

B. Fundamental Requirements

1. All health care buildings shall be so designed, constructed, maintained, and operated as to minimize the possibility of a fire emergency requiring the evacuation of occupants. Because the safety of occupants of health care buildings cannot be assured adequately by dependence on evacuation of the building, their protection from the fire shall be provided by appropriate arrangement of facilities, adequate staffing, and careful development of operating and maintenance procedure composed of the following:
 - a. Proper design, construction, and compartmentation;
 - b. Provisions for detection, alarm, and extinguishment; and
 - c. Fire prevention and the planning, training, and drilling in programs for the isolation of fire and transfer of occupants to areas of refuge or evacuation of the building.
2. It is recognized that in buildings housing various types of psychiatric patients, it may be necessary to lock doors and bar windows to confine and protect building inhabitants. Sections of this Rule requiring the keeping of exits unlocked maybe waived by the Chief, BFP or his duly authorized representative. It is also recognized that some psychiatric patients are not capable of seeking safety without guidance. In buildings in which doors are locked or windows are barred, provisions shall be made for the removal of occupants by such reliable means as the remote control of locks or by keying all locks to keys carried by attendants.

C. Emergency Rooms, Operating Rooms, Intensive Care Units, Delivery Rooms and Other Similar Facilities

Emergency rooms, operating rooms, intensive care units, delivery rooms and other similar facilities shall not be located more than one (1) storey above or below the floor of exit discharge. In existing buildings where any of the aforementioned facilities are located above or below the floor of exit discharge, same shall be equipped with ramps complying with Section 10.2.5.7 of this IRR.

D. New Construction, Additions, Conversion

1. Any addition shall be separated from any existing non-conforming structure by a non-combustible fire partition having at least a 2-hour fire resistance rating. Communicating openings in such dividing fire partition shall occur only in corridors and shall be protected by an approved self-closing fire door. Such doors shall normally be kept closed.
2. Any building converted to these occupancies shall comply with all requirements for new facilities.

E. Occupancy and Occupant Load

1. Health care occupancies in buildings housing other occupancies shall be completely separated from them by noncombustible construction having at least a two (2)-hour fire-resistance rating. All means of egress from health care occupancies that traverse non-health care spaces shall conform to requirements of this standard for health care occupancies. Any occupancy with a hazard of contents classified higher than that of the health care and located in the same building as health care occupancies shall be protected. Industrial, office, mercantile and storage occupancies categorized as high hazard shall not be permitted in buildings housing health care occupancies.
2. Sections of health care buildings may be classified as other occupancies if they meet at the following conditions:
 - a. They are not intended to serve health care occupants for purposes of housing, treatment, customary access, or means of egress.
 - b. They are adequately separated from areas of health care occupancies by construction having a two-(2) hour fire resistance rating.
3. Auditoriums, chapels, staff residential areas, garages or similar occupancies provided in connection with health care occupancy shall have exits provided in accordance with other applicable sections of this Chapter.
4. The occupant load for which means of egress shall be provided for any floor shall be the maximum number of persons intended to occupy that floor but not less than one (1) persons for each eleven

square meters (11.1 m^2) gross floor area in health care sleeping departments and not less than one (1) persons for each twenty two square meters (22.3 m^2) of gross floor area of inpatient health care treatment departments. Gross floors areas shall be measured within the exterior building walls with no deductions.

SECTION 10.2.10.2 EXIT DETAILS

A. Number and Types

1. Exits shall be restricted to the following permissible types:
 - a. Doors leading directly outside the building
 - b. Stairs and smoke-proof enclosures
 - c. Ramps
 - d. Horizontal exits
 - e. Exit Passageways
2. At least two (2) exits of the above types, remote from each other, shall be provided for each floor or fire section of the building.
3. Elevators constitute a supplementary facility, but shall not be counted as required exits.

B. Capacity of Exits

The capacity of means of egress shall be in accordance with Section 10.2.5.2 para "C" of this IRR.

C. Access to Exit

1. Every aisle, passageway, corridor, exit discharge, exit location and access shall be in accordance with Section 10.2.5.2 of this IRR, except as modified in the succeeding paragraphs of this subsection.
2. Travel distance shall comply with the following:
 - a. Between any room door intended as exit access and an exit shall not exceed thirty (30) meters;
 - b. Between any point in a room and an exit shall not exceed forty six (46) meters;
 - c. Between any point in a health care sleeping room or suite and an exit access door of that room or suite shall not exceed fifteen (15) meters.

- d. Travel distance shall be measured in accordance with Section 10.2.5.2 of this IRR.
- e. The travel distances in para (2) (a) and (b) above may be increased by fifteen meters (15 m) in buildings completely equipped with an automatic fire suppression system.

3. Every health care sleeping room, unless it has a door opening at ground level, shall have an exit access door leading directly to a corridor which leads to an exit. One adjacent room such as a sitting or anteroom may intervene if all doors along the path of exit travel are equipped with non-lockable hardware, and this intervening room is not intended to serve more than eight (8) health care sleeping beds. However, special nursing suites or nurseries permitted in this Division shall not be limited to eight (8) cribs or bassinets.
4. Aisles, corridors and ramps required for exit access of exit in hospitals or nursing homes shall be at least two hundred forty four (244) centimeters in clear and unobstructed width. Aisles, corridors and ramps required for exit access or exit in a residential-custodial care institution shall be at least one hundred eighty three centimeters (183 cm) in clear and unobstructed width. Corridors and ramps in adjunct areas not intended for the housing, treatment, or use of inpatients, shall be at least one hundred eighty three centimeters (183 cm) in clear and unobstructed width.
5. Any rooms and any suite or rooms of more than ninety three square meters (93 m^2) shall have at least two (2) exit access doors remote from each other.
6. Every exit or exit access shall be so arranged that no corridor or aisle has a pocket or dead-end exceeding six meters (6 m).
7. Any health care sleeping room which complies with the requirements previously set forth in this section may be subdivided with non fire-rated, non-combustible partitions, provided, that the arrangement allows for direct and constant visual supervision by nursing personnel. Rooms which are so subdivided shall not exceed four hundred sixty five square meters (465 m^2).

D. Doors

1. Doors shall be in accordance with Section 10.2.5.3, except as modified in this subsection. For door requirements in horizontal exits and smoke partitions, see Section 10.2.5.6, Section 10.2.6.**Error! Reference source not found.**9 and this Section.
2. Locks shall not be permitted on patient sleeping room doors.

Exception No. 1: Key-locking devices that restrict access to the room from the corridor and that are operable only by staff from the corridor side shall be permitted. Such devices shall not restrict egress from the room.

Exception No. 2: Door-locking arrangements shall be permitted in health care occupancies, or portions of health care occupancies, where the clinical needs of the patients require specialized security measures for their safety, provided that keys are carried by staff at all times.

3. Exit access doors from hospital and nursing home sleeping rooms, diagnostic and treatment rooms or areas such as X-ray, surgery and physical therapy, all doors between these spaces and the required exits, and all exit doors serving these spaces shall be at least one hundred twelve (112) centimeters. Doors to residential-custodial sleeping rooms and door to nursery sleeping rooms and all exit doors serving these spaces shall be at least ninety one centimeters (91 cm) wide.
4. Any door in a fire separation, horizontal exit or a smoke partition may be held open only by an electrical device which complies with Section 10.2.5.3. Each of the following systems shall be so arranged as to initiate the self-closing action throughout the entire health care facility.
 - a. The required alarm system
 - b. The required automatic fire detection system
 - c. An approved automatic fire suppression system,
5. Doors in stair enclosures and in walls surrounding hazardous areas shall not be equipped with hold-open devices.

E. Stairs and Smokeproof Enclosures

Every stair and smokeproof enclosure shall be in accordance with Section 10.2.5.4.

F. Horizontal Exits

A horizontal exit shall be in conformance with Section 10.2.5.6 and/or as modified in this subsection.

1. At least two and eight-tenths (2.80) square meter per occupant in a hospital or nursing home or one and four-tenths (1.40) square meter per occupant in a residential-custodial care institution shall be provided on each side of the horizontal exit for the total number of

occupants in adjoining compartments.

2. A single door may be used as a horizontal exit if it serves one direction, only and is at least one hundred twelve centimeters (112 cm) wide for a hospital or nursing home or at least ninety one centimeters (91 cm) wide for residential-custodial care institutions. The swing shall be in the direction of exit travel.
3. A horizontal exit involving a corridor two and four tenths (2.40) meters or more in width serving as means of egress from both sides of the doorway shall have the opening protected by a pair of swinging doors, each door having a clear width of 1055 mm and swinging in the opposite direction from the other.
4. An approved vision panel is required in each horizontal exit door. Center mullions are prohibited.

G. Ramps

Ramps in accordance with Section 10.2.5.7 shall be permitted.

H. Emergency Lighting, Exit Markings, Alarms and Communication Systems

1. Each hospital shall be provided with emergency lighting as described in Section 10.2.5.11 and exit markings as described in Section 10.2.5.12 of this IRR. Such emergency lighting and the illumination of required exits and directional signs shall be supplied by the Life Safety Branch of the hospital electrical system as described in NFPA 99, Standard for Health Care Facilities. The Life Safety Branch shall also serve alarms, emergency communication systems and the illumination of generator set locations as described in paragraph (c), (d) and (e), Section 312 of the same reference.
2. Each nursing home and residential-custodial care facility shall have emergency lighting in accordance with Section 10.2.5.11 of this IRR. Emergency lighting with at least 1 ½ hour duration shall be provided.
3. Exit signs shall be provided in each hospital, nursing home, and residential custodial care facility in accordance with Section 10.2.5.12 of this IRR.

SECTION 10.2.10.3 PROTECTION

A. Subdivision of Building Spaces

1. Smoke Partitions Required - Smoke partitions shall be provided, regardless of building construction type, as follows:
 - a. To divide into at least two (2) compartments every storey used by

inpatients for sleeping or treatment and any storey having an occupant load of fifty (50) or more persons.

- b. To limit on any storey the maximum area of each smoke compartment to no more than two thousand one hundred square meters ($2,100\text{ m}^2$), of which both length and width shall be no more than forty six meters (46 m).

Note: Protection may be accomplished in conjunction with the provisions of horizontal exits.

2. Smoke partitions shall be provided on storeys which are usable but unoccupied.
3. Any smoke partition shall be constructed in accordance with Section 10.2.6.9 of this IRR and shall have a fire resistance rating of at least one (1) hour.
4. At least two and eight-tenths square meters (2.8 m^2) per occupant for the total of bed or litter patients shall be provided on each side of the smoke partition. On other storeys not housing bed or litter patients at least one half square meter (0.5 m^2) per occupant shall be provided on each side of the smoke partition for the total number of occupants in adjoining compartments.
5. Corridor openings in smoke partitions shall be protected by a pair of swinging doors, door to swing in a direction opposite from the other. The minimum width of each door for hospitals and nursing homes shall be one hundred twelve centimeters (112 cm), while that for residential-custodial care institutions shall be eighty one centimeters (81 cm).
6. Doors in smoke partitions shall comply with Section 10.2.6.9 of this IRR and shall be self-closing and held open only if they meet the requirements of this section.
7. Vision panels of approved transparent wired glass not exceeding forty six-hundredth square meter (0.46 m^2) in steel frames shall be provided in all doors in smoke partitions.
8. Stops are required on the head and sides of door frames in smoke partitions and center mullions are prohibited.

B. Minimum Construction Standards

1. Health care buildings of one (1) storey only may be constructed of protected non-combustible construction, fire-resistive construction, protected ordinary construction, protected wood frame construction, heavy timber construction or unprotected noncombustible construction. For the purpose of this subsection, storeys shall be

counted starting at the lowest floor of exit discharge. All levels below the floor of exit discharge shall be separated from the floor of exit discharge by at least protected non-combustible construction.

2. Health care buildings two (2) storeys or more shall be at least fire-resistive construction.
3. Health care occupancies two (2) or more storeys shall have enclosure walls of non-combustible materials having a fire resistance rating of at least two (2) hours around stairways, elevators, chutes, and other vertical openings between floors.
4. All interior walls and partitions in buildings of fire-resistive and non-combustible construction shall be composed on non-combustible materials.
5. Every health care sleeping room shall have an outside window or outside door arranged and located so that it can be opened from the inside without the use of tools or keys to permit the products of combustion and to permit any occupant to have direct access to fresh air in case of emergency. The maximum allowable sill height shall not exceed ninety one centimeters (91 cm) above the floor except that in special nursing care areas the window sill may be one and a half meters (1.5 m) above the floor.

C. Construction of Corridor Walls

1. Corridors shall be separated from use areas by partitions having a fire-resistance rating of at least one (1) hour.
2. These walls shall be continuous from the floor slab to the underside of the floor or roof slab above, through any concealed spaces such as those above the, suspended ceilings and through interstitial structural and mechanical spaces.
3. Doors with a twenty (20) minute fire protection rating shall be used on openings other than those serving exits or hazardous areas. Doors shall be provided with latches of a type suitable for keeping the door tightly closed.
4. Transfer grills, whether protected by fusible link-operated dampers or not, shall not be used in these walls or doors.
5. Fixed wired glass vision panels may be placed in corridor walls, provided they do not exceed eighty four-hundredth square meters (0.84 m²) in size and are installed in approved steel frames. Fixed wired glass vision panels may be installed in wooden doors, provided they do not exceed forty six-hundredth square meters (0.46 m²) size and are installed in approved steel frames.

6. Waiting areas of twenty three square meters (23 m²) or less on an institutional sleeping floor of fifty six square meters (56 m²) or less on other floors may be open to the corridor, provided that they are located to permit direct supervision by the institutional staff so arranged as not to obstruct any access to required exits. Such areas shall be equipped with an electrically supervised automatic smoke detection system installed in accordance with this Section. Not more than one such waiting area is permitted in each smoke compartment.

D. Protection of Vertical Openings and Fire-stopping

1. Any stairway, ramp, elevator shaft, light and ventilation shaft, chute and other openings between storeys shall be enclosed with noncombustible materials in accordance with Section 10.2.5.2., Section 10.2.6.2 of this IRR and this Section.
2. A door in a stairway enclosure shall be self-closing, shall normally be kept in closed position and shall be marked in accordance with Section 10.2.5.3 of this IRR.
3. Fire-stopping shall be provided in accordance with Section 10.2.6.5 of this IRR.

E. Interior Finish

Interior finish of walls and ceilings in means of egress and of any room shall be Class A in accordance with Section 10.2.6.3 of this IRR, while floor finish material shall be Class A or B throughout all hospitals, nursing homes and residential-custodial care facilities.

F. Alarm, Detection and Extinguishment Systems

1. Every building shall have an electrically supervised automatic fire alarm system capable of being manually operated in accordance with Section 10.2.6.4 of this IRR. The fire alarm system shall be installed with provisions for future connection to the nearest BFP station in the locality. Internal audible alarm devices shall be provided in accordance with Section 10.2.6.4 of this IRR. Pre-signal systems shall not be permitted in healthcare occupancies.
2. An approved automatic heat and/or smoke detection system shall be installed in all corridors of hospitals, nursing homes, and residential-custodial care facilities, such systems shall be installed in accordance with the applicable standards of the NFPA 72, but in no case shall smoke detectors be spaced further apart than nine (9) meters on centers or more than four and six-tenths meters (4.60 m) from any wall all automatic heat and/or smoke detection systems required by this section shall be electrically inter-connected to the fire alarm system.

3. Approved, supervised sprinkler system shall be provided throughout all hospitals, nursing homes, and residential-custodial care facilities. Replenishment of water supplies shall be strictly considered in the design. Quick-response sprinklers shall be required in smoke compartments containing patient sleeping rooms.
4. Approved, supervised sprinkler system shall be in accordance with the requirements of Section 10.2.6.5 of this IRR.
5. In light hazard occupancies, required automatic fire suppression systems shall be in accordance with Section 10.2.6.5 of this IRR for systems and shall be electrically interconnected with the fire alarm system. The main automatic fire suppression control valve shall be electrically monitored so that at least a local alarm will sound when the valve is closed.
6. If the fire suppression system is an automatic sprinkler, its piping serving no more than six (6) sprinklers for any isolated hazardous area, may be connected directly to a domestic water supply system having a capacity sufficient to provide six (6) liters per minute per square meters of floor area throughout the entire enclosed area. An outside-screw-and-yoke shutoff valve shall be installed in an accessible location between the sprinklers and the connection to the domestic water supply.
7. Portable fire extinguishers shall be provided in all institutional occupancies in accordance with Section 10.2.6.5 of this IRR.

G. Hazardous Areas

Any hazardous area shall be segregated and protected in accordance with Section 10.2.6.8 of this IRR. Hazardous areas include, but are not limited to the following:

Boiler and heater rooms	*Rooms or spaces, including shops, used for the storage of combustible supplies and equipment in quantities deemed hazardous by the Chief, BFP or his duly authorized representative.
Laundries	
Kitchens	
Repair shops	
Handicraft shops	
Employee locker rooms	Trash collection rooms
*Soiled linen rooms	Gift shops
*Paint shops	

Those areas marked by asterisk (*) shall be both separated and provided with automatic fire suppression system.

SECTION 10.2.10.4 BUILDING SERVICE EQUIPMENT

A. Air Conditioning, Ventilating, Heating, Cooking and Other Service

Equipment

1. Air-conditioning, ventilating, heating, cooking and other service equipment shall be in accordance with Division 7 of this Chapter.
2. Any heating device other than a central heating plant shall be so designed and installed that combustible material will not be ignited by it or its appurtenances. If fuel fired, such heating devices shall be chimney or vent connected, shall take air for combustion directly from outside, and shall be so designed and installed to provide for complete separation of the combustion system from the atmosphere of the occupied area. The heating system shall have safety devices to immediately stop the flow of fuel and shut down the equipment in case of either excessive temperatures or ignition failure. Fire-places may be installed and used only in areas other than patient sleeping areas, provided that these areas are separated from patient sleeping spaces by construction having a one-hour fire resistance rating. In addition thereto, the fireplace shall be equipped with a hearth that shall be raised at least ten centimeters (10 cm), and a heat tempered glass fireplace enclosure guaranteed against breakage up to a temperature of three hundred forty three (343°C) degrees Celsius. If special hazards are present, a lock on the enclosure and other safety precautions may be required.
3. Combustion and ventilation air for Boiler, incinerator or heater rooms shall be taken directly from and discharged directly to the outside air.
4. Any rubbish chute and linen chute including pneumatic systems shall be safeguarded in accordance with Section 10.2.6.2and 10.2.7.4 of this IRR. An incinerator shall not be directly flue-fed nor shall any floor charging chute directly connect with the combustion chamber. Any rubbish chute shall discharge into a rubbish collecting room used for no other purpose and protected in accordance with Section 10.2.6.8 of this IRR

DIVISION 11. DETENTION AND CORRECTIONAL OCCUPANCIES

SECTION 10.2.11.1 GENERAL REQUIREMENTS

A. Definition

Detention and correctional occupancies shall include those used for purposes such as correctional institutions, detention facilities, community residential centers and substance abuse or rehabilitation centers where occupants are confined or housed under some degree of restraint or security.

B. Occupancy

1. For the application of the life safety requirements of this Division, the resident user category shall be divided into the following five groups.
 - a. **Use Condition I — Free Egress.** Free movement is allowed from sleeping areas and other spaces where access or occupancy is permitted to the exterior via means of egress that meet the requirements of this IRR.
 - b. **Use Condition II — Zoned Egress.** Free movement is allowed from sleeping areas and any other occupied smoke compartment to one or more other smoke compartments.
 - c. **Use Condition III — Zoned Impeded Egress.** Free movement is allowed within individual smoke compartments, such as within a residential unit comprised of individual sleeping rooms and a group activity space, with egress impeded by remote-controlled release of means of egress from such a smoke compartment to another smoke compartment.
 - d. **Use Condition IV — Impeded Egress.** Free movement is restricted from an occupied space. Remote-controlled release is provided to allow movement from all sleeping rooms, activity spaces, and other occupied areas within the smoke compartment to another smoke compartment.
 - e. **Use Condition V — Contained.** Free movement is restricted from an occupied space. Staff-controlled manual release at each door is provided to allow movement from all sleeping rooms, activity spaces, and other occupied areas within the smoke compartment to another smoke compartment.
2. To be classified as Use Condition III or Use Condition IV, the arrangement, accessibility, and security of the release mechanism(s) used for emergency egress shall be such that the minimum available staff, at any time, can promptly release the locks.
3. Areas housing occupancies corresponding to Use Condition I shall conform to the requirements of residential occupancies under this Chapter.

Exception: Use Condition I facilities shall be permitted to conform to the requirements of this Division for Use Condition II facilities, provided that said facilities is provided with a 24-hour on-duty staff.

C. Occupant Load

The occupant load for which means of egress shall be provided for any floor shall be the maximum number of persons intended to occupy that

floor but not less than one (1) person for each eleven and one-tenth square meters (11.1 m^2) gross floor area.

SECTION 10.2.11.2 EXIT DETAILS

A. Types

1. Exits shall be restricted to the following permissible types:
 - a. Doors
 - b. Stairs and smoke-proof enclosures
 - c. Horizontal exits
 - d. Exit passageways

B. Capacity of Exits

The capacity of means of egress shall be calculated in accordance with Section 10.2.5.2 para "C" of this IRR.

C. Number of Exits

1. At least two (2) exits of the above types, remote from each other, shall be provided for each floor or fire section of the building.
2. Exit access travel shall be permitted to be common path not exceeding thirty meters (30 m).

D. Access to Exit

Every aisle, passageway, corridor, exit discharge, exit location and access shall be in accordance with Section 10.2.5.2 of this IRR.

E. Arrangement of Means of Egress

1. Every sleeping room shall have a door leading directly to an exit access corridor, unless otherwise permitted by the following:
 - a. If there is an exit door opening directly to the outside from the room at the ground level.
 - b. One adjacent room, such as a day room, group activity space, or other common space shall be permitted to intervene. Where sleeping rooms directly adjoin a day room or group activity space that is used for access to an exit, such sleeping rooms shall be permitted to open directly to the day room or space and shall be

permitted to be separated in elevation by a one-half or full storey height.

2. No exit or exit access shall contain a corridor, hallway, or aisle having a pocket or dead end exceeding six meters (6 m).
3. A sally port shall be permitted in a means of egress where there are provisions for continuous and unobstructed travel through the sally port during an emergency egress condition.

F. Travel Distance to Exits

1. Between any room door intended as exit access and an exit shall not exceed thirty meters (30 m);
2. Between any point in a room and an exit shall not exceed forty six meters (46 m); and
3. Any point in a sleeping room to the door in that room shall have a maximum travel distance of ten meters (10 m).

G. Discharge from Exits

1. Exits shall be permitted to discharge into a fenced or walled courtyard, provided that not more than two walls of the courtyard are the building walls from which egress is being made. Enclosed yards or courts shall be of sufficient size to accommodate all occupants at a distance of not less than fifteen meters (15 m) from the building while providing a net area of one and four-tenths square meters (1.4 m^2) per person.
2. All exits shall be permitted to discharge through the level of exit discharge. This requirement shall be waived, provided that not more than 50 percent of the exits discharge into a single fire compartment separated from other compartments by construction having not less than a 1-hour fire resistance rating.

H. Emergency Lighting and Exit Markings

1. Means of egress shall be illuminated in accordance with Section 10.2.5.11 of this IRR.
2. Emergency lighting shall be provided in accordance with Section 10.2.5.11 of this IRR.
3. Exit signs shall be provided in areas accessible to the public.

SECTION 10.2.11.3 PROTECTION

A. Protection of Vertical Opening

1. Any vertical opening shall be enclosed or protected.

Exception no. 1: Unprotected vertical openings in accordance with Section 10.2.6.2 of this IRR shall be permitted.

Exception no. 2: In sleeping quarters smoke compartments, unprotected vertical openings shall be permitted in accordance with the conditions of 10.2.6.2 of this IRR, provided that the height between the lowest and highest finished floor levels does not exceed seven meters (7 m). The number of levels shall not be restricted. Sleeping quarters subdivided in accordance with this section shall be permitted to be considered as part of the communicating space. The separation shall not be required to have a fire resistance rating.

B. Interior Finish

Interior finish shall be Class A or Class B

C. Detection, Alarm and Communication Systems

1. Detention and correctional occupancies shall be provided with a fire alarm system in accordance with Section 10.2.6.4 of this IRR, except as modified by the succeeding paragraphs.
2. Initiation of the required fire alarm system shall be by manual means in accordance with Section 10.2.6.4 of this IRR, by means of any required detection devices or detection systems, and by means of waterflow alarm in the sprinkler system.

Exception No. 1: Manual fire alarm boxes shall be permitted to be locked, provided that staff is present within the area when it is occupied and staff has keys readily available to unlock the boxes.

Exception No. 2: Manual fire alarm boxes shall be permitted to be located in a staff location, provided that the staff location is attended when the building is occupied and that the staff attendant has direct supervision of the sleeping area.

3. Occupant notification shall be accomplished automatically in accordance with Section 10.2.6.4 of this IRR, a positive alarm sequence shall be permitted.

Exception: any smoke detectors required by this chapter shall be permitted to be arranged to alarm at a constantly attended location only and shall not be required to accomplish general occupant

notification.

4. Fire department notification shall be accomplished in accordance with section 10.2.6.4 of this IRR, a positive alarm sequence shall be permitted .

Exception no. 1: Any smoke detectors required by this chapter shall not be required to transmit an alarm to the fire department.

Exception no. 2: This requirement shall not apply where staff is provided at a constantly attended location that has the capability to promptly notify the fire department or has direct communication with a control room having direct access to the fire department.

5. An approved automatic smoke detection system shall be in accordance with Section 10.2.6.4 of this IRR, as modified by the para 6 through 8 hereof throughout all resident sleeping areas and adjacent day rooms, activity rooms, or contiguous common spaces.
6. Smoke detectors shall not be required in sleeping rooms with four or fewer occupants.
7. Other arrangements and positioning of smoke detectors shall be permitted to prevent damage or tampering, or for other purposes. Such arrangements shall be capable of detecting any fire, and the placement of detectors shall be such that the speed of detection is equivalent to that provided by the spacing and arrangements required by the installation standards referenced in Section 10.2.6.4 of this IRR. Detectors shall be permitted to be located in exhaust ducts from cells, behind grilles, or in other locations.
8. Smoke detectors shall not be required in Use Condition II open dormitories where staff is present within the dormitory whenever the dormitory is occupied.

D. Extinguishment Requirements

1. All buildings classified as Use Condition II, Use Condition III, Use Condition IV, or Use Condition V shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 10.2.6.5 of this IRR.
2. The automatic sprinkler system required by the preceding paragraph shall be fully supervised and electrically connected to the fire alarm system.
3. Portable fire extinguishers shall be provided in accordance with Section 10.2.6.5 para "C" of this IRR.

Exception No. 1: Access to portable fire extinguishers shall be permitted to be locked, provided that personnel are on duty on a 24-hour basis and keys are readily available to unlock access to the extinguishers.

Exception No. 2: Portable fire extinguishers shall be permitted to be located at staff locations only.

4. Standpipe and hose systems shall be provided in accordance with Section 10.2.6.5 "C" of this IRR as follows:

- a. Class I standpipe systems shall be provided for any building over two storeys in height.
- b. Class III standpipe and hose systems shall be provided for all nonsprinklered buildings over two storeys in height.

Exception No. 1: Separate Class I and Class II systems shall be permitted in lieu of a Class III system.

E. Subdivision of Building Spaces

1. Every storey used for sleeping by residents, or any other storey with an occupant load of fifty (50) or more persons, shall be subdivided into compartments by means of smoke barrier.
2. The requirement for subdivision of building space shall be permitted as follows:
 - a. By smoke compartments having exit to the public way, provided that such exit serves only one area and has no opening to other areas;
 - b. A building separated from the resident housing area by 2 – hour fire resistance rating or 14 meters of open area ; and
 - c. Secured open area holding a space located 15 meters from the housing area that provides 1.4 m^2 or more of refuge area for each person.

F. Hazardous Areas

1. Any hazardous area shall be protected in accordance with Section 10.2.6.8 The areas described in Table 13 shall be protected as indicated.

Table 13: HAZARDOUS AREA OPERATION

HAZARDOUS AREA DESCRIPTION	SEPARATION/PROTECTION
Areas not incidental to resident housing	2 hours
Boiler and fuel-fired heater rooms	1 hour
Central or bulk laundries > 9.3 m ²	1 hour
Commercial cooking equipment	In accordance with 3.601
Commissaries	Smoke resistant
Employee locker rooms	Smoke resistant
Hobby/handicraft shops	Smoke resistant
Maintenance shops	Smoke resistant
Padded cells	1 hour
Soiled linen rooms	1 hour
Storage rooms >4.6 m ² in area but 9.3 m ² in area storing combustible material	Smoke resistant
Storage rooms >9.3 m ² storing combustible materials	1 hour
Trash collection rooms	1 hour

Doors used to access the areas specified above shall meet the requirements for doors at smoke barriers for the applicable use condition.

2. Where smoke barriers are required, they shall limit the occupant load to not more than 200 residents in any smoke compartment and limit the travel distance to a door in a smoke barrier as follows:
 - a. The distance from any room door required as exit access shall not exceed forty five meters (45 m).
 - b. The distance from any point in a room shall not exceed sixty meters (60 m).
3. Any required smoke barrier shall be constructed in accordance with Section 10.2.6.9. Barriers shall be of substantial construction and shall have structural fire resistance.
4. Openings in smoke barriers shall be protected in accordance with Section 10.2.6.9 of this IRR, provided, that, there shall be no restriction on the total number of vision panels in any barrier. Provided, further, that sliding doors in smoke barriers that are designed to normally be kept closed and are remotely operated from a continuously attended location shall not be required to be self-closing.
5. Not less than fifty six hundredths square meters (0.56 m²) of net area per occupant shall be provided on each side of the smoke barrier for

the total number of occupants in adjoining compartments. This space shall be readily available wherever occupants are moved across the smoke barrier in a fire emergency.

6. Doors shall provide resistance to the passage of smoke. Swinging doors shall be self-latching, or the opening resistance of the door shall be not less than 22 N.
7. Doors in smoke barriers shall conform to the requirements for doors in means of egress and shall have locking and release arrangements according to the applicable use condition.
8. Vision panels shall be provided in smoke barriers at points where the barrier crosses an exit access corridor.
9. Smoke dampers shall be provided.

SECTION 10.2.11.4 BUILDING SERVICE EQUIPMENT

- A. Air-conditioning, ventilating, heating, cooking and other service equipment shall be in accordance with Division 7 of this Chapter, and shall be installed in accordance with the manufacturer's specifications, except as modified in the following paragraphs.
- B. Combustion and ventilation air for boiler or incinerator shall be taken directly from and discharged directly to the outside air.
- C. Any rubbish chute and linen chute including pneumatic systems shall be safeguarded in accordance with Sections 10.2.6.2 and 10.2.7.4 of this IRR. An incinerator shall not be directly flue-fed nor shall any floor charging chute directly connect with the combustion chamber. Any trash chute shall discharge into a trash collecting room used for no other purpose and protected in accordance with Section 10.2.6.8 of this IRR.

DIVISION 12. RESIDENTIAL OCCUPANCIES

SECTION 10.2.12.1 CLASSIFICATION

Residential occupancies shall include all occupancies so classified in Division 3 of this IRR. They shall be classified in the following groups, subject to determination by the Chief, BFP or his duly authorized representative.

- A. **Hotels** – includes buildings or groups of building under the same management in which there are more than fifteen (15) sleeping accommodations for hire, primarily used by transients who are lodged with or without meals, whether designated as a hotel, inn, motel, or by any other name. So-called appartelle, condotel or pension houses shall be classified as hotels, because they are potentially subject to transient

occupancy like that of hotels.

- B. **Dormitories** – includes buildings where group sleeping accommodation are provided for persons, not members of the same family group in one room or in series of closely associated room under joint occupancy and single management, as in college dormitories, convents, fraternity houses, military barracks, and the like.
- C. **Apartment Buildings** – includes buildings containing three (3) or more living units independent cooking and bathroom facilities, whether designated as condominium, row house, apartment house, tenement, garden apartment, or by any other name.
- D. **Lodging or Rooming Houses** – includes building in which separate sleeping rooms are rented providing sleeping accommodations for a total of fifteen (15) or less persons, on either a transient or permanent basis; with or without meals, but without separate cooking facilities for individual occupants.
- E. **Single-and-Two Family Dwellings** – includes detached dwellings in which each living unit is occupied by members of a single family.

SECTION 10.2.12.2 REQUIREMENTS

A. Occupant Load

The occupant load of residential occupancies in number of persons for whom exits are to be provided except in detached single-and-two-family dwellings shall be determined on the basis of one (1) person per eighteen and six-tenths square meters (18.6 m^2) gross floor area, or the maximum probable population of any room or section under consideration, whichever is greater. The occupant load of any open mezzanine or balcony shall be added to the occupant load of the floor below for the purpose of determining exit capacity.

B. Capacity of Exits

Capacity of means of egress shall be in accordance with Section 10.2.5.2 paragraph "C" of this IRR.

C. Maintenance of Exits

- 1. No door in any means of egress shall be locked against egress when the building is occupied.
- 2. No residential occupancy shall have its means of egress pass through any nonresidential occupancy in the same building, except in buildings provided with approved, supervised sprinkler system provided that the means of egress shall not pass through a high hazard content

area as determined by the City/Municipal Fire Marshal having jurisdiction and the means of egress shall be separated by a construction of not less than 1 hour.

3. No guest room or guest suite shall be permitted to be located above a nonresidential occupancy except when the guest room or guest suite and its exits are separated from the nonresidential occupancy by construction having a fire resistance rating of not less than 1 hour or when the nonresidential occupancy is protected throughout by approved, supervised sprinkler system.

SECTION 10.2.12.3 HOTELS AND DORMITORIES

A. Requirements

1. Any ballroom assembly or exhibition hall, and other space used for purposes of public assembly shall be in accordance, with Division 7 of this Chapter. Restaurant having a capacity of fifty (50) or more persons shall be treated as places of assembly.
2. Any dormitory divided into suites of rooms, with one or more bedrooms opening into a living room or study that has a door opening into a common corridor serving number of suites, shall be classified as an apartment building.

B. Exit Details

1. Requirements

- a. Any room having a capacity of less than fifty (50) persons with an outside door at street or ground level may have such outside door as a single exit provided that no part of the room or area is more than fifteen and one-fourth meters (15.25 m) from the door measured along the natural path of travel.
- b. Any floor below the floor of exit discharge occupied for public purposes shall have exits arranged in accordance with the subsequent paragraph of this Section, with access thereto in accordance with Section 10.2.5.2 of this IRR.
- c. Any floor below the floor of exit discharge not open to the public and used only for mechanical equipment, storage, and service operations (other than kitchens which are considered part of the hotel occupancy) shall have exits appropriate to its actual occupancy in accordance with applicable sections of this Chapter.

- d. The same stairway or other exit required to serve any one upper floor may also serve other upper floor, except that no inside open stairway, escalator, or ramp may serve as a required egress from more than one floor.

2. Types of Exits

Exits, arranged in accordance with Division 5 of this Chapter, shall be one or more of the following types:

- a. Doors, provided that doors in any means of egress shall not be locked against egress when the building is occupied. Delayed egress locks may be permitted, provided that not more than one such is located in any one egress path.
- b. Stairs and smokeproof enclosures.
- c. Ramps.
- d. Horizontal exits.

3. Minimum Corridor Width

Corridors, other than those in within individual guest rooms or individual guest suites, shall be of sufficient width to accommodate the required occupant load and shall not be less than one hundred twelve centimeters (112 cm).

4. Number of Exits

Not less than two (2) exits shall be accessible from every floor, including floors below the floor of exit discharge and occupied for public purposes.

5. Travel Distance to Exits

- a. Any exit shall be such that it will not be necessary to travel more than thirty meters (30 m) from the door of any room to reach the nearest exit.
- b. Travel distance within a guest room or guest suite to a corridor door shall not exceed twenty three meters (23 m) in buildings not protected by an approved, supervised automatic sprinkler system.
- c. Travel distance within a guest room or guest suite to a corridor door shall not exceed thirty eight meters (38 m) in buildings protected by an approved, supervised sprinkler system.

6. Access to and Arrangement of Exits

- a. Access to all required exits shall be in accordance with Section 10.2.5.2 of this IRR, shall be unobstructed, and shall not be veiled from open view by ornamentation, curtain, or other appurtenance.
- b. Means of egress shall be so arranged that, from every point in any open area or from any room door, exits will be accessible in at least two (2) different directions.
- c. Doors between guest rooms and corridors shall be self-closing.
- d. Common path of travel shall not exceed ten meters (10 m).
- e. Dead end corridors shall not exceed six meters (6 m).

7. Discharge from Exits

- a. At least half of the required number of units of exit from upper floors, exclusive of horizontal exits, shall load directly to the street or through a yard, court, or passageway with protected openings and separated from all parts of the interior of the buildings.
- b. A maximum of fifty percent (50%) of the exits may discharge through areas on the floor of exit discharge provided:
 - i. Such exits discharge to a free and unobstructed way to the exterior of the building, which way is readily visible and identifiable from the point of discharge from the exit.
 - ii. The floor of discharge into which the exit discharge is provided with automatic fire suppression system and any other portion of the level of discharge with access to the discharge area is provided with automatic fire suppression system or separated from it in accordance with the requirements for the enclosure of exit. (See Section 10.2.5.2 of this IRR),
 - iii. The entire area on the floor of discharge is separated from areas below by construction having a minimum fire-resistance rating of two (2) hours.

8. Lighting and Signs

- a. Each public space, hallway, stairway, or other means of egress shall have illumination in accordance with Section 10.2.5.11 of this IRR. Access to exit shall be continuously illuminated at all times. Any hotel and dormitory shall have emergency lighting installed in individual guest rooms or guest suites, hallways, landings of stairways and other appropriate areas as determined by the C/MFM having jurisdiction.

- b. Every exit access door from public hallways or from corridors on floors with sleeping accommodations shall have an illuminated sign in accordance with Section 10.2.5.12 of this IRR. Where exits are not visible in a hallway or corridor, illuminated directional signs shall be provided to indicate the direction of exit.

C. Protection

1. Protection of Vertical Openings

- a. Every stairway, elevator shaft and other vertical openings shall be enclosed or protected in accordance with Section 10.2.6.2 of this IRR.
- b. Any required exit stair which is so located that it is necessary to pass through the lobby or other open space to reach the outside of the building shall be continuously enclosed down to the lobby level.
- c. No floor below the floor of exit discharge, used only for storage, heating requirements, or other than hotel occupancy open to guest or the public, shall have unprotected openings to floors used for hotel purposes.

2. Protection of Guest Rooms

- a. In any new hotel building every corridor shall be separated from guest rooms by partitions having at least a one (1) hour fire resistance rating.
- b. Each guest room shall be provided with a door having a fire protection rating at least twenty (20) minutes.
- c. Openings in corridor partitions other than door openings shall be prohibited.
- d. Doors that open directly onto exit access corridors shall be self-closing and self-latching.

3. Interior Finish

Interior finish, in accordance with Section 10.2.6.3 of this IRR and subject to the limitations and modifications therein specified, shall be as follows:

a. For new construction or new Interior Finish

- i. Exits – Class A or Class B;
- ii. Lobbies, corridors – Class A or Class B;

iii. Places of assembly – See Section 10.2.8.1 of this IRR;

iv. Individual guest rooms – B, or C; and

b. Existing Interior Finish

i. Exits – Class A or B;

ii. Lobbies and Corridors;

ii.a. Used as exit access – Class A or B

ii.b. Not used as required exit access – Class A, B or C

iii. Places of Assembly – See Section 10.2.8.16 of this IRR;

iv. Individual guest rooms – Class A, B or C; and

v. Other rooms – Class A, B or C.

4. Fire Detection and Alarm System

- a. An automatic fire detection and alarm system, in accordance with Section 10.2.6.4 of this IRR, shall be provided for any hotel or dormitory having accommodations for fifteen (15) or more guests. For less than 15 guests, a manual fire alarm system shall be installed.
- b. Every sounding device shall be of such character and so located as to arouse all occupants of the building or section thereof endangered by fire.
- c. An alarm-sending station and manual fire alarm box shall be provided at the hotel desk or other convenient central control point under continuous supervision of responsible employees.
- d. Suitable facilities shall be provided for immediate notification of the BFP.
- e. Positive fire alarm sequence may be permitted.
- f. Hotels and dormitories including its guest rooms and guests suites shall be required to be equipped with both audible and visible notification appliance.
- g. In hotels and dormitories not equipped with automatic fire detection and alarm system, guest rooms, living area and sleeping rooms within a guest suite shall be installed with single-station smoke detectors.

5. Extinguishing Requirements

- a. All buildings shall be protected throughout by an approved, supervised sprinkler system except in buildings where all guest sleeping rooms or guest suites have a door opening directly outside at the street or grade level or exterior exit access arranged in accordance with Section 10.2.5.2 of this IRR in buildings up to and including three (3) storeys in height.
- b. Listed quick response or listed residential sprinklers shall be used throughout guest rooms and guest room suites.
- c. Portable fire extinguishers shall be installed in accordance with Section 10.2.6.7 of this IRR.

6. Subdivision of Building Spaces

- a. In buildings not protected by an approved, supervised automatic sprinkler system, each hotel guest room, including guest suites, and dormitory rooms shall be separated from other guest rooms or dormitory rooms by walls and floors having fire resistance ratings of not less than one (1) hour.
- b. In buildings protected throughout by an approved, supervised automatic sprinkler system, each hotel guest room, including guest suites, and dormitory room shall be separated from other guest rooms or dormitory rooms by walls and floors constructed a fire barriers having fire resistance ratings of not less than one half ($\frac{1}{2}$) hour.

7. Hazardous Areas

- a. Any room containing high pressure boilers, refrigerating machinery, transformers, or other service equipment to possible explosion shall not be located directly under or directly adjacent to exits. All such rooms shall be effectively cut off from other parts of the building as specified in Section 10.2.6.8 of this IRR.
- b. Every hazardous area shall be separated from other parts of the building by construction having a fire-resistance rating of at least one (1) hour and communicating openings shall be protected by approved automatic or self-closing fire doors, or such area shall be equipped with automatic fire suppression system. Where a hazard is high as determined by the City/Municipal Fire Marshal having jurisdiction, both fire-resistive construction and automatic fire suppression system shall be used. Hazardous areas include, but are not limited to:

- i. Boiler and heater rooms
- ii. Laundries
- iii. Repair shops
- iv. Rooms or spaces used storage of combustible supplies and equipment in quantities deemed hazardous by the City/Municipal Fire Marshal having jurisdiction.

D. Building Service Equipment

1. Air-Conditioning and Ventilation

- a. Every air conditioning installation shall comply with Division 7 of this Chapter.
- b. No transom/windowpane shall be installed in partition of sleeping rooms in new buildings. In existing buildings transoms shall be fixed in the closed position and shall be covered or otherwise protected to provide a fire-resistance rating at least equivalent to that of the wall in which they are installed.

2. All other building services equipment installed or used in hotels and dormitories shall comply with Division 7 of this Chapter.

SECTION 10.2.12.4 APARTMENT BUILDINGS

A. General Requirements

- 1. Any apartment building which complied with all of the preceding requirements of this Section for hotels may be considered as a hotel and as such, the following requirements for apartment buildings will not be applicable.
- 2. Every individual unit covered by this Section shall at least comply with the minimum provisions of Section 10.2.12.6 of this IRR entitled Single and Two-Family Dwellings.

B. Exit Details

1. General Types and Capacities of Exits

- a. Exits of the same arrangement, types and capacities, as required by Section 10.2.12.3 of this IRR shall be provided.
- b. Street floor exits shall be sufficient for the occupant load of the street floor plus the required capacity of stairs and ramps discharging onto the street floor.

2. Number of Exits

- a. Every living unit shall have access to at least two (2) separate exits.

Exception 1: Any living unit, which has an exit directly to the street or yard at ground level or by way of an outside stairway that serve a maximum of two units or an enclosed stairway with fire-resistance rating of one (1) hour or more serving that apartment only and not communicating with any floor below the floor of exit discharge or other area not a part of the apartment served, may have a single exit.

Exception 2: Apartment buildings of not more than three storeys in height with not more than six (6) living units per floor, with a smoke-proof enclosure or an outside stairway as the exit, immediately accessible to all apartments served thereby, may have a single exit.

Exception 3: Any building not more than three (3) storeys in height with no floor below the floor of exit discharge or, in case there is such a floor, with the street floor construction of at least one-hour fire resistance, may have a single exit, under the following conditions:

- i. The stairway is completely enclosed with a partition having a fire resistance rating of at least one (1) hour with self-closing fire doors protecting all openings between the stairway enclosed and the building.
- ii. The stairway does not serve any floor below the floor of exit discharge,
- iii. All corridors serving as access to exits at least a one (1) hour fire-resistance rating.
- iv. There is not more than six and one-tenth meters (6.10 m) of travel distance to reach an exit from entrance door of any living unit.

3. Minimum Corridor Width

- a. Corridors with a required capacity of more than 50 persons shall be of sufficient width to accommodate the required occupant load but have a width of not less than one hundred twelve centimeters (112 cm).
- b. Corridors with a required capacity of not more than 50 persons shall not be less than ninety one centimeters (91 cm).

4. Access to Exits

- a. Exits shall be remote from each other, as required by Section 10.2.5.2 of this IRR.
- b. Exits shall be so arranged that there are no dead-end pockets, hallways, corridors, passageways or courts.
- c. Exits and exit access shall be so located that:
 - i. It will not be necessary to travel more than fifteen and one-half meters (15.50 m) within any individual living unit to reach the nearest exit, or to reach an entrance door of the apartment which provides access through a public corridor to an exit on the same floor level.
 - ii. Within any individual living unit it will not be necessary to traverse stairs more than one (1) storey above or below the floor level of the apartment to the nearest exit or entrance door.
 - iii. The entrance door to any apartment is within thirty one meters (31 m) of an exit or within forty six and a half meters (46.50 m) in a building protected by approved, supervised sprinkler system in accordance with Section 10.2.6.5 of this IRR.
- d. Doors between apartments and corridors shall be self-closing.

5. Discharge from Exits

Discharge from exits shall be the same as required for hotels. (See Section 10.2.12.3 of this IRR)

6. Lighting and Signs

- a. Every public space, hallway, stairway, and other means of egress shall have illumination in accordance with Section 10.2.5.11 of this IRR. All apartment buildings shall have emergency lighting.
- b. Signs in accordance with Section 10.2.5.12 of this IRR shall be provided in all apartment buildings .

C. Protection

1. Segregation of Dwelling Units

Dwelling units in row apartments shall be separated from each other by partition walls having a fire resistance rating of four (4) hours. Such walls shall be constructed solidly and continuously from the ground to level one (1) meter above the ridge line of the roof.

2. Protection of Vertical Openings

Protection of vertical openings shall be the same as required for hotels. (See Section 10.2.12.3 of this IRR) There shall be no unprotected vertical opening in any building or fire section with only one exit.

3. Interior Finish

a. For new construction and new interior finish

- i. Exits - Class A or Class B;
- ii. Lobbies, corridors and public spaces - Class A or B; and
- iii. Individual living units - Class A or B or C

b. Existing Interior Finish

- i. Exits - Class A or B
- ii. Other spaces - Class A or B or C.

4. Alarm Systems

- a. Every apartment building of four (4) storeys or more in height, or more than twelve (12) apartment units shall have an automatic fire detection and alarm system in accordance with Section 10.2.6.4 of this IRR, except buildings provided with approved, supervised sprinkler protection in accordance with Section 10.2.6.5 of this IRR.
- b. Apartment buildings of not more than three (3) storeys in height shall be provided with manual fire alarm system, provided that dwelling units shall be installed with single – station or multi – station smoke detectors.

5. Extinguishing Requirements

- a. All buildings shall be protected throughout by an approve, supervised sprinkler system except in buildings where all guest sleeping rooms or guest suites have a door opening directly outside at the street or grade level or exterior exit access arranged in accordance with Section 10.2.5.2 of this IRR in buildings up to and including three (3) storeys in height.
- b. Listed quick response or listed residential sprinklers shall be used throughout all dwelling units.
- c. Portable fire extinguishers shall be installed in accordance with Section 10.2.6.5 of this IRR.

6. Hazardous Areas

- a. Every hazardous area shall be separated from other parts of the building construction having a fire-resistance rating of at least one (1) hour. Communicating openings shall be protected by approved automatic or self-closing fire doors. Hazardous areas include, but shall not be limited to:
 - Boiler and heater rooms
 - Laundries
 - Repair Shops
 - Rooms or spaces used for storage of combustible supplies and equipment in quantities deemed hazardous by the C/MFM having jurisdiction.
- b. Where the hazard is high as determined by the C/MFM having jurisdiction, both fire-resistant construction and automatic fire suppression system shall be provided.

D. Building Service Equipment

1. **Air-Conditioning and Ventilation** – Air conditioning and ventilation, when provided, shall be in accordance with Division 7 of this Chapter.
2. All other building services equipment installed or used in hotels and dormitories shall comply with Division 7 of this Chapter.

SECTION 10.2.12.5 LODGING OR ROOMING HOUSES

A. General

1. This Section applies only to lodging or rooming houses providing sleeping accommodations for less than fifteen (15) persons, as specified in Section 10.2.12.1 of this IRR.
2. In addition to the following provisions, every lodging or rooming house shall comply with the minimum requirements for detached single and two family dwellings.

B. Means of Escape Requirement

1. Every sleeping room and living area shall have access to two means of escape complying with that of single or two family dwelling.
2. Every sleeping room above or below the street floor shall have access to two (2) separate means of exit, at least one (1) of which shall consist of an enclosed interior stairway, an exterior stairway, a fire escape or a horizontal exit.

3. All exits shall be arranged to provide a safe path of travel to the outside of the building without traversing any corridor or space exposed to an unprotected vertical opening.
4. Any sleeping room below the street floor shall have direct access to the outside or the building.

C. Alarm System

A manual fire alarm system shall be provided in accordance with Section 10.2.6.4 of this IRR.

SECTION 10.2.12.6 SINGLE AND TWO FAMILY DWELLINGS

A. General

This Section covers detached single and two family dwellings as specified in Section 10.2.12.1 of this IRR. Where the occupancy is so limited, the only requirements applicable are those in this Section.

B. Means of Escape Requirements

1. Number, Type and Access to Means of Escape

- a. In any dwelling of more than two (2) rooms, every room used for sleeping, living or dining purposes shall have at least two (2) means of escape at least one (1) of which shall be a door or stairway providing a means of unobstructed travel to the outside of the building at street or ground level. No room or space shall be occupied for living or sleeping purposes which is accessible only by a ladder, folding stairs or through a trap door.
- b. Every sleeping room shall have at least one (1) outside window. Such window could be opened from the inside, without the use of tools, keys or special effort or knowledge to provide a clear opening of not less than five hundred sixty millimeters (560 mm) in width and eight hundred millimeters (800 mm) in height. The bottom of the opening shall be not more than one hundred twenty two centimeters (122 cm) above the floor, except if the room has two (2) doors providing separate ways of escape or has a door leading directly outside of the building.
- c. No required path of travel to the outside from any room shall be through another room or apartment not under the immediate control of the occupant of the first room or his family, not through a bathroom or other space subject to locking.
- d. No exit access from sleeping rooms to outside shall be less than ninety centimeters (90 cm) wide.

2. Doors

- a. No doors in the path of travel providing means of escape shall be less than seventy centimeters (70 cm) of clear width.
- b. Every closet door latch shall be such that children can open the door from inside the closet.
- c. Every bathroom door lock shall be designed to permit the opening of the locked door from the outside in an emergency.

3. Stairs

The width, risers, and treads of every stair shall comply at least with the minimum requirements for stairs, as described in Section 10.2.5.4 of this IRR.

C. Interior Finish

Interior finish of occupied spaces of new buildings shall be Class A, B or C as defined in Section 10.2.6.3 of this IRR and in existing buildings the interior finish shall be Class A, B, C or D.

D. Building Service Equipment

No heating equipment such as stove or combustion heater shall be so located as to block escape in case of fire arising from malfunctioning of the stove or heater.

DIVISION 13. MERCANTILE OCCUPANCIES

SECTION 10.2.13.1 GENERAL REQUIREMENTS

A. Classification of Occupancy

1. Mercantile occupancies shall include all buildings and structures or parts thereof with occupancy as described in Division 3 of this Chapter.

2. Sub-classification of Occupancy

- a. Mercantile occupancies shall be classified as follows:
 - i. **Class A.** All stores having aggregate gross area of two thousand seven hundred eighty seven square meters ($2,787 \text{ m}^2$) or more, or utilizing more than three (3) floor levels for sales purposes.
 - ii. **Class B.** All stores of less than two thousand seven hundred eighty seven square meters ($2,787 \text{ m}^2$) aggregate area, but

over two hundred eighty seven square meters (287 m²), or utilizing any balcony, mezzanine or floor above or below the street floor level for sales purposes except that if more than three (3) floors are utilized, the store shall be considered Class A, regardless of area.

- iii. **Class C.** All stores of two hundred seventy eight square meters (278 m²) or less gross area used for sales purposes on the street floor only.
- b. For the purpose of Class A and Class B, C, the aggregate gross area shall be the total area of all floors used for mercantile purposes and, where a store is divided into sections by fire walls shall include the area of all sections used for sales purposes. Areas of floors not used for sales purposes, such as a floor below the street floor used only for storage and not open to the public, shall not be counted for the purpose of the above classifications, but exits shall be provided for such non-sales area in accordance with their occupancy, as specified by other Divisions of this Chapter.
- c. A balcony or mezzanine floor having an area less than one-half (1/2) of the floor below shall not be counted as a floor level for the purpose of applying the classification, but if there are two (2) balconies or mezzanine floors, one (1) shall be counted.
- d. Storeys not used for sales above or below sales floor are not counted in the height classification.
- e. A mezzanine less than or equal to 1/3 the area (new) or less than or equal to ½ the area (existing) of the floor below is permitted.
- f. Where a number of stores under different management are located in the same building or in adjoining buildings with no fire wall or other standard fire separations in between, the aggregate gross of all such stores shall be used in determining classification.

B. Classification of Hazard

The contents of mercantile occupancies shall be classified in accordance with Division 4 of this Chapter.

Exception: Mercantile occupancies classified as high hazard in accordance with Division 4 of this Chapter shall meet the following additional requirements:

1. Exits shall be located not more than twenty three (23) meters of travel from any point is needed to reach the nearest exit.
2. From every point there shall be at least two (2) exits accessible by

travel in different directions (no common path of travel).

3. All vertical opening shall be enclosed.

C. Occupant Load

1. For purposes of determining required exits, the occupant load of mercantile buildings or parts of building used for mercantile purposes shall not be less than the following:
 - a. Street floor, one (1) person for each two and eight-tenths square meters (2.8 m^2) gross floor area. In stores with no street floor as defined in Division 2 of this Chapter, but with access directly from the street by stairs or escalators, the principal floor at the point of entrance to the store shall be considered the street floor. In stores where due to difference in grade of streets on different sides, there are two (2) or more floors directly accessible from the street (not including alleys or similar back streets), each such floor shall be considered a street floor for the purpose of determining occupant load.
 - b. Due to differences in grade of streets on different sides, two or more floors directly accessible from streets (not including alleys or similar back streets) exist; each such floor is permitted to be considered a street floor. The occupant load factor is one person for each 3.7 square meters of gross floor area of sales space.
 - c. Sales floors below the street floor: same as street floor.
 - d. Upper floors, used for sale: one (1) person for each five and six tenths square meters (5.6 m^2) gross floor area.
 - e. Floor or sections used only for offices, storage, shipping and not open to the general public: one (1) person for each nine and three-tenths (9.3 m^2) square meters gross floor area.
 - f. Floors or sections used for assembly purposes: occupant load determined in accordance with Division 8 of this Chapter.
 - g. Covered Walls: one (1) person for each two and eight-tenths square meters (2.8 m^2) gross floor area.
2. Where any required egress capacity from a balcony or mezzanine passes through the room below, that required capacity shall be added to the required egress capacity of the room below.

SECTION 10.2.13.2 EXIT DETAILS

A. General

1. All exit facilities shall be in accordance with Division 5 of this Chapter and this Division. Only types of exits specified in this Section shall be used as required exit facilities in any mercantile occupancy.
2. Where a stairway, escalator, outside stair, or ramp serves two (2) or more upper floors, the same stairway or other exit required to serve anyone (1) upper floor may also serve other upper floors.

Exception: No inside open stairway, escalator, or ramp may serve as required egress facility from more than one (1) floor.

3. Where there are two (2) or more floors below the street floor, the same stairway or other exit may serve all floors, but all required exits from such areas shall be independent of any open stairways between street and the floor below it.
4. Where a level outside exit from upper floors is possible owing to hills, such outside exits may serve instead of horizontal exits. If, however, such outside exits from the upper floor also serve as an entrance from a principal street, the upper floor shall be classified as a street, and is subject to the requirements of this Section for street floors.

B. Types of Exits

1. Exits shall be restricted to the following permissible types:
 - a. Doors;
 - b. Stairs and Smokeproof Enclosures;
 - c. Horizontal exits; and
 - d. Ramps.
2. In existing interior stair or fire escape not complying with Section 10.2.5.4 or Section 10.2.5.10 of this IRR may be continued in use, subject to the approval of the City/Municipal Fire Marshal having jurisdiction.

C. Capacity of Means of Egress

1. The capacity of means of egress shall be in accordance with Section 10.2.5.2 of this IRR.
2. In Class A and Class B mercantile occupancies, street floor exits shall be sufficient for the occupant load of the street floor plus the required

capacity of stairs and ramps discharging through the street floor.

D. Number of Exits

1. Exits shall comply with the following, except as otherwise permitted by paragraphs (2) through (5) below:
 - a. The number of means of egress shall be in accordance with Section 10.2.5.2 of this IRR.
 - b. Not less than two separate exits shall be provided on every storey.
 - c. Not less than two separate exits shall be accessible from every part of every storey.
2. Exit access as required by para (1) (c) above, shall be permitted to include a single exit access path for the distances permitted as common path of travel.
3. A single means of egress shall be permitted in a Class C mercantile occupancy, provided that the travel distance to the exit or to a mall does not exceed twenty meters (23 m).
4. A single means of egress shall be permitted in a Class C mercantile occupancy, provided that the travel distance to the exit or to a mall does not exceed thirty meters (30 m), and the storey on which the occupancy is located, and all communicating levels that are traversed to reach the exit or mall, are protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 10.2.6.5 of this IRR.
5. A single means of egress to an exit or to a mall shall be permitted from a mezzanine within any Class A, Class B, or Class C mercantile occupancy, provided that the common path of travel does not exceed thirty meters (30 m) if protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 10.2.6.5 of this IRR.

E. Arrangement and Access of Exits

1. Exits shall be remote from each other and shall be arranged to minimize the possibility that both may be blocked by an emergency.

Exception: A common path may be permitted for the first fifteen (15) meters from any point. (See Section 10.2.13.1 of this IRR, if there are high hazard contents).

2. The aggregate width of all aisles leading to each exit shall be equal to

at least the required width of the exit.

3. In no case shall aisle be less than eighty centimeters (80 cm) in clear width.
4. In Class A stores, at least one (1) aisle of one and one-half meters (1.5 m) minimum width shall lead directly to an exit.
5. In the only means of entrance of customer is through one (1) exterior wall of the building, two-thirds (2/3) of the required exit width shall be located in this wall,
6. At least one-and one-half (1.5) of the required exits shall be so located as to be reached without going through check-out stands In no case shall checkout stands or associated railings or barriers obstruct exits or required aisles or approached thereto.

F. Measurement of Travel Distance to Exits

Travel distance to exits shall be measured in accordance with Section 10.2.5.2 of this IRR.

Exception: An increase in the above travel distance to forty six (46) meters shall be permitted in a building completely protected by an approved, supervised sprinkler system in accordance with Section 10.2.6.5 of this IRR.

G. Discharge from Exits

In buildings with automatic fire suppression system in accordance with Section 10.2.6.5 of this IRR, one-half (0.5) of rated number of exit units of stairways, escalators or ramps serving as required exits from floors above or below the street floor, may discharge through the main street floor area, instead of directly to the street, provided that:

1. Not more than one-half (0.5) of the required exit units from any single floor considered separately discharge through the street floor area.
2. The exits are enclosed in accordance with Section 10.2.6.2 of this IRR, to the street floor.
3. The distance of travel from the termination of the enclosure to an outside street door is-not more than fifteen and one-half meters (15 .5 m).
4. The street floor doors provide sufficient units of exit width to serve exits discharging through the street floor in addition to the street floor itself, per Section 10.2.13.1 o f this IRR.

H. Doors

1. Every street floor door shall be in accordance with Section 10.2.5.3 of this IRR, and a horizontal exit door, if used, in accordance with Section 10.2.5.6 of this IRR.
2. All doors at the foot of stairs from upper floors or at the end of stairs leading to floors below the street floor shall swing with the exit travel.

I. Exit Signs and Lighting

1. Every mercantile occupancy shall have exit illumination and signs in accordance with Section 10.2.5.11 and 10.2.5.12 of this IRR.
2. Every Class A and Class B store shall have emergency lighting facilities conforming to Section 10.2.5.11 of this IRR.

SECTION 10.2.13.3 PROTECTION

A. Protection of Vertical Openings

1. Any stairway, elevator shaft, escalator opening or other critical opening shall be enclosed or protected in accordance with Section 10.2.6.2 of this IRR, except as permitted in this Section.
2. **Exceptions for Class A or Class B stores**
 - a. In any Class A or Class B store, openings may be unprotected between any two (2) floors, such as open stairs or escalators between street floor and the floor below, or open stairs to second floor or balconies or mezzanines above the street floor level (not both to the floor below the street floor and above unless protected throughout by an approved, supervised automatic fire suppression system).
 - b. In any Class A or Class B store protected throughout by an approved, supervised sprinkler system in accordance with Section 10.2.6.5 openings may be unprotected under the conditions permitted by Section 10.2.6.2 of this IRR or between the street floor and the floor below the street and between street floor and second floor or, if no openings to the floor below the street floor, between street floor, street floor balcony, or mezzanine, and second floor, but not between more than three (3) floor levels.
 - c. In existing Class A or Class B stores only one (1) floor above those otherwise permitted may open if such floor is not used for sales purposes and the entire building is protected by an approved, supervised automatic fire suppression system.

3. Exceptions for Class C stores

In any Class C store, openings may be unprotected between street floor and balcony or mezzanine.

B. Interior Finish

1. Interior finish of exits of all stores shall be Class A and Class B in accordance with Section 10.2.6.3 of this IRR.
2. In any Class A or Class B store, interior finish of the ceiling shall be Class A or Class B in accordance with Section 10.2.6.3 of this IRR, unless completely protected by an approved, supervised automatic fire suppression system in accordance with Section 10.2.6.5 of this IRR, in which case Class C interior finish may be used in any Class A or Class B store, interior finish of the walls shall be Class A, Class B or Class C in accordance with Section 10.2.6.3 of this IRR.
3. In any mercantile occupancy, exposed portions of structural members complying with the requirements for heavy timber construction may be permitted. Laminated wood shall be delaminate under the influence of heat.
4. In a Class C store, interior finish shall be Class A, B or C in accordance with Section 10.2.6.3 of this IRR.

C. Alarm Systems

Class A and Class B stores shall be provided with an automatic and manual fire alarm system in accordance with Section 10.2.6.4 of this IRR.

D. Automatic Sprinkler Protection

Approved, supervised automatic sprinkler system protection shall be installed in accordance with Section 10.2.6.5 of this IRR in all mercantile occupancies as follows:

1. Throughout all mercantile occupancies three or more storeys in height.
2. Throughout all mercantile occupancies exceeding one thousand one hundred fifteen square meters ($1,115 \text{ m}^2$) in gross area.
3. Throughout floor below the street floor having an area exceeding two hundred thirty two square meters (232 m^2) when used for the sale, storage or handling of combustible goods and merchandise.

E. Hazardous Areas

1. An area used for general storage, boiler or furnace rooms, fuel

storage, janitor closet, maintenance shops including woodworking and painting areas, and kitchens shall be separated from other parts of the building by construction having a fire-resistance rating of not less than one (1) hour, and all openings shall be protected with self-closing fire doors.

2. Areas which high hazard contents as defined in Division 4 of this Chapter, shall be provided with both fire-resistive construction and automatic fire suppression system.
3. Cooking equipment shall be protected in accordance with NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, unless the cooking equipment is one of the following types:
 - a. Outdoor equipment;
 - b. Portable equipment;
 - c. Equipment used only for food warming.

SECTION 10.2.13.4 BUILDING SERVICE EQUIPMENT

- A. Air conditioning, ventilating, heating, cooking, and other service equipment shall be in accordance with Division 7 of this Chapter.
- B. An elevator shall not constitute required means of exit. When mercantile occupancies are more than three (3) storeys or more than three (3) storeys above the street floor and equipped with automatic elevator, one (1) or more elevators and escalators shall be designed and equipped for fire emergency use by fire fighters as specified in Division 7 of this Chapter. Key operation shall transfer automatic elevator operation to manual and bring elevator to the street floor for use of fire service. The elevator shall be situated so as to be readily accessible by firefighters.

SECTION 10.2.13.5 SPECIAL PROVISIONS

A. Self-Service Stores

1. In any self-service store, no check-out stand or associated railings or barriers shall obstruct exits or required aisles or approaches thereto.
2. In every self-service store where, wheeled carts or buggies are used by customers, adequate provision shall be made for the transit and parking of such carts to minimize the possibility that they may obstruct exits.

B. Open-Air Mercantile Operations

1. Open-air mercantile operations, such as open-air markets, gasoline filling stations, auto LPG refilling stations, roadside stands for the sale of farm produce and other outdoor mercantile operations shall be so arranged and conducted as to maintain free and unobstructed ways of travel at all times to permit prompt escape from any point of danger in case of fire or other emergency, with no dead ends in which persons might be trapped due to display stands, adjoining buildings, fences, vehicles, or other obstructions.
2. If mercantile operations are conducted in roof-over areas, they shall be treated as mercantile buildings, provided that canopies over individual small stands to protect merchandise from the weather shall not be construed to constitute buildings for the purpose of this Chapter.

C. Combined Mercantile and Residential Occupancies.

No dwelling unit shall have its sole means of exit through any mercantile occupancy in the same building.

Exception No. 1: Where the dwelling occupancy and exits therefrom are separated from the mercantile occupancy by construction having a fire resistance rating of at least one (1) hour.

Exception No. 2: Where the mercantile occupancy is protected by automatic fire suppression system in accordance with Section 10.2.6.5 of this IRR.

Exception No. 3: Where an existing building with not more than two (2) dwelling units above the mercantile occupancy is protected by an automatic fire detection systems in accordance with Section 10.2.6.4 of this IRR.

D. Covered Malls and Walkway.

A covered or roofed interior area used as a pedestrian public way and connecting buildings housing individual or multiple tenants. Use of the term covered mall shall include covered walkways.

1. **Covered Mall and Walkways.** - A covered or roofed interior area used as a pedestrian public way and connecting buildings housing individual or multiple tenants. Use of the term covered mall shall include covered walkways.
2. A covered mall and all buildings connected to it shall be treated as a single mercantile building and shall be subject to the requirements for

mercantile occupancies, except as provided herein.

3. Exit Details

- a. Every covered mall shall have no less than two (2) exits located remote from each other.
- b. No less than one-half (0.5) the required exit widths for each Class A or Class B store connected to a covered mall shall lead directly outside without passing through the mall.
- c. Every mall shall be provided with unobstructed exit access, parallel to and adjacent to the connected buildings: This exit access shall extend to each mall exit.
- d. In no case shall an exit access through a covered mall be less than three (3) meters and sixty six centimeters (66 cm) in clear width.

DIVISION 14. BUSINESS OCCUPANCIES

SECTION 10.2.14.1 GENERAL REQUIREMENTS

A. Classification of Occupancy

Business Occupancies shall include all buildings and structures or parts thereof with occupancy described in Division 3 of this Chapter.

B. Classification of Hazard of Contents

The contents of business occupancies shall be classified as ordinary hazard in accordance with Division 4 of this Chapter. For purposes of the design of an automatic fire suppression system, as office occupancy shall be classified as "Light hazard occupancy".

C. Occupant Load

1. For purposes of determining required exits, the occupant load of business purposes shall be no less than one (1) person per nine and three tenths square meters (9.3 m^2) of gross floor area.
2. In the case of mezzanine or balcony open to the floor below of other unprotected vertical openings between floors, the occupant load of the mezzanine or other subsidiary floor level shall be added to that of the street floor for the purpose of determining required exits. However, in no case shall the total number of exit units be less than would be required if all vertical openings were enclosed.

SECTION 10.2.14.2 EXIT DETAILS

A. General

1. All exit facilities shall be in accordance with Section 10.2.5.10 of this IRR and this Division. However, only types of exits specified in Subsection b on types of exits may be used as required exit facilities in any business occupancy with access thereto and ways of travel therefrom in accordance with Section 10.2.5.2 of this IRR.
2. If, owing to differences in grade level, any street floor exits are at points above or below the street or ground level, such exits shall comply with the provisions for exits from upper floors or floors below the street floor.
3. Stairs and ramps serving two (2) or more floors below a street floor occupied for business use shall be permitted in accordance with para (4) and (5) below.
4. Where two (2) or more upper floors below the street floor are occupied for business use, the same stairs or ramps shall be permitted to serve each.
5. An inside open stairway or inside open ramp shall be permitted to serve as a required egress facility from not more than one (1) floor level below the street floor.
6. Floor levels below that are below the street floor; are used only for storage, heating, and other service equipment; and are not subject to business occupancy shall have means of egress in accordance with Division 16 (Storage Occupancies) of this IRR.

B. Types of Exits

1. Exits shall be restricted to the following permissible types:
 - a. Doors.
 - b. Stairs and smoke proof enclosures.
 - c. Horizontal exits.
 - d. Ramps.
 - e. Exit Passageways
 - f. Fire escape ladders

C. Capacity of Means of Egress

1. The capacity of means of egress shall be in accordance with Section 10.2.5.2 of this IRR.
2. The clear width of any corridor or passageway serving an occupant load of fifty (50) or more shall be not less than 1.12 meters.
 - a. It is not the intent that this provision apply to non-corridor or non-passageway areas of exit access, such as the spaces between rows of desks created by office layout or low-height partitions.
3. Street floor exits shall be sufficient for the occupant load of the street floor plus the required capacity of stairs and ramps discharging through the street floor.

D. Number of Exits

1. Exits shall comply with the following, except as otherwise permitted by para (2) through (6) below:
 - a. The number of means of egress shall be in accordance with Section 10.2.5.2 of this IRR.
 - b. Not less than two (2) separate exits shall be provided on every storey.
 - c. Not less than two (2) separate exits shall be accessible from every part of every storey.
2. Exit access, as required by para (D) (1) (a) through (c) above, shall be permitted to include a single exit access path for the distances permitted as common paths of travel.
3. A single exit shall be permitted for a room or area with a total occupant load of fewer than 100 persons, provided that the following criteria are met:
 - a. The exit shall discharge directly to the outside at the level of exit discharge for the building.
 - b. The total distance of travel from any point, including travel within the exit, shall not exceed 30 meters.
 - c. The total distance of travel specified in para (3) (b) above shall be on the same floor level or, if traversing of stairs is necessary, such stairs shall not exceed four thousand five hundred seventy millimeters (4570) mm in height and the stairs shall be provided with complete enclosures to separate them from any other part of the building, with no door openings therein.

- d. A single outside stair in accordance with Section 10.2.5.4 of this IRR shall be permitted to serve all floors permitted within the 4570 mm vertical travel limitation.
- 4. Any business occupancy not exceeding three (3) storeys, and not exceeding an occupant load of 30 people per floor, shall be permitted a single separate exit to each floor, provided that the following criteria are met:
 - a. This arrangement shall be permitted only where the total travel distance to the outside of the building does not exceed thirty meters (30 m) and where the exit is enclosed in accordance with Section 10.2.6.2 of this IRR, serves no other levels, and discharges directly to the outside.
 - b. A single outside stair in accordance with Section 10.2.5.5 of this IRR shall be permitted to serve all floors.
- 5. A single means of egress shall be permitted from a mezzanine within a business occupancy, provided that the common path of travel does not exceed twenty three meters (23 m), or thirty meters (30 m) if protected throughout by an approved, supervised automatic sprinkler system in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems.
- 6. A single exit shall be permitted for a maximum two-storey, single-tenant space/building that is protected throughout by an approved, supervised sprinkler system in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems and where the total travel to the outside does not exceed thirty meters (30 m).

E. Arrangement of Means of Egress

- 1. Means of egress shall be arranged in accordance with Section 10.2.5.2 of this IRR.
- 2. Dead-end corridors shall be permitted in accordance with the following:
 - a. In buildings protected throughout by an approved, supervised automatic sprinkler system in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, dead-end corridors shall not exceed fifteen meters (15 m).
 - b. In buildings other than those complying with para (c) below, dead-end corridors shall not exceed six meters (6 m).
 - c. It is recognized that dead ends exceeding the permitted limits exist

and, in some cases, are impractical to eliminate. The City/Municipal Fire Marshal having jurisdiction might permit such dead ends to continue to exist, taking into consideration any or all of the following:

- i. Tenant arrangement
- ii. Automatic sprinkler protection
- iii. Smoke detection
- iv. Exit remoteness

3. Limitations on common path of travel shall be in accordance with the following:

- a. Common path of travel shall not exceed thirty meters (30 m) in a building protected throughout by an approved, supervised automatic sprinkler system in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems.
- b. Common path of travel shall not exceed thirty meters (30 m) within a single tenant space having an occupant load not exceeding 30 persons.
- c. In buildings other than those complying with para (3) (a) or (b) above, the common path of travel shall not exceed twenty three meters (23 m).
- d. It is recognized that common paths of travel exceeding the permitted limits exist and, in some cases, are impractical to eliminate. The authority having jurisdiction might permit such common paths of travel to continue to exist, taking into consideration any or all of the following:
 - i. Tenant arrangement;
 - ii. Automatic sprinkler protection; and
 - iii. Smoke detection.
 - iv. Exit remoteness

F. Travel Distance to Exits

1. In buildings protected throughout by an approved, supervised sprinkler system in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, the travel distance shall not exceed sixty one meters (61 m).

2. In buildings other than those complying with para (1) above, the travel distance, measured in accordance with Section 10.2.5.2 of this IRR, shall not exceed forty-six meters (46 m).

G. Discharge from Exits

Exit discharge shall comply with Section 10.2.5.2 of this IRR.

H. Exit Signs and Lighting

1. Exit illumination shall be provided in accordance with Section 10.2.5.11 of this IRR.
2. Emergency lighting shall be provided in accordance with Section 10.2.5.11 of this IRR in any building where any one of the following conditions exists:
 - a. The building is two (2) or more storeys in height above the level of exit discharge.
 - b. The occupancy is subject to fifty (50) or more occupants above or below the level of exit discharge.
 - c. The occupancy is subject to three hundred (300) or more total occupants.
3. Emergency lighting in accordance with 10.2.5.11 of this IRR shall be provided for all underground and limited access structures.
4. Means of egress shall have signs in accordance with Section 10.2.5.12 of this IRR.

SECTION 10.2.14.3 PROTECTION

A. Protection of Vertical Openings

1. Vertical openings shall be enclosed or protected in accordance with section 10.2.6.2 of this IRR, unless otherwise permitted by the following:
 - a. Unenclosed vertical openings in accordance with Section 10.2.6.2 of this IRR shall be permitted.
 - b. Exit stairs shall be permitted to be unenclosed in two-storey, single tenant spaces that are provided with a single exit in accordance with Section 10.2.14.2 para "D" (6) of this IRR.
 - c. Unprotected vertical openings shall be permitted in existing buildings complying with all of the following:

- i. Where protected throughout by an approved automatic sprinkler system in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems.
- ii. Where no unprotected vertical opening serves as any part of any required means of egress.
- iii. Where required exits consist of exit doors that discharge directly to grade in accordance with Section 10.2.5.3, outside stairs in accordance with Section 10.2.5.4, smokeproof enclosures in accordance with Section 10.2.5.4, or horizontal exits in accordance with Section 10.2.5.6 of this IRR.

d. Floors that are below the street floor and are used for storage or other than a business occupancy shall have no unprotected openings to business occupancy floors.

B. Interior Finish

- 1. Interior finish shall be in accordance with Section 10.2.6.3 of this IRR.
- 2. Interior wall and ceiling finish.
 - a. Interior wall and ceiling finish material complying with Section 10.2.6.3 of this IRR shall be Class A or Class B in exits and in exit access corridors.
 - b. Interior wall and ceiling finishes shall be Class A, Class B, or Class C in areas other than those specified in para (a) above.
- 3. Interior floor finish
 - a. Interior floor finish shall comply with Section 10.2.6.3 of this IRR.
 - b. Interior floor finish in exit enclosures shall be Class I or Class II.

C. Detection, Alarm, and Communications Systems

- 1. A fire alarm system in accordance with Section 10.2.6.4 of this IRR shall be provided in all business occupancies where any one of the following conditions exists:
 - a. The building is two (2) or more storeys in height above the level of exit discharge.
 - b. The occupancy is subject to fifty (50) or more occupants above or below the level of exit discharge. For existing building, the occupancy is subject to one hundred (100) or more occupants above or below the level of exit discharge.

- c. The occupancy is subject to three hundred (300) or more total occupants. For existing building, the occupancy is subject to one thousand (1000) or more total occupants.
- 2. **Initiation.** Initiation of the required fire alarm system shall be by one of the following means:
 - a. Manual means in accordance with Section 10.2.6.4 of this IRR.
 - b. Means of an approved automatic fire detection system that complies with Section 10.2.6.4 of this IRR, and provides protection throughout the building.
 - c. Means of an approved automatic sprinkler system that complies with Section 10.2.6.5 of this IRR, and provides protection throughout the building.
- 3. **Occupant notification.** During all times that the building is occupied, the required fire alarm system, once initiated, shall perform one of the following functions:
 - a. For new and existing building, it shall activate a general alarm in accordance with Section 10.2.6.4 throughout the building. A positive alarm sequence in accordance with Section 10.2.6.4 of this IRR shall be permitted.
 - b. For existing building, a pre-signal system in accordance with Section 10.2.6.4 of this IRR shall be permitted.
 - c. For new and existing building, it shall activate an alarm signal in a continuously attended location for the purpose of initiating emergency action by personnel trained to respond to emergencies as follows:
 - i. Emergency action shall be initiated by means of live voice public address system announcements originating from the attended location where the alarm signal is received, unless otherwise permitted by para (iii) below.
 - ii. The live voice public address system shall be permitted to be used for other announcements, provided that the emergency action use takes precedence over any other use.
 - iii. In lieu of live voice public address system announcements, any other occupant notification means in accordance with Section 10.2.6.4 of this IRR shall be permitted.

D. Protection from Hazard

1. Hazardous areas including, but not limited to, areas used for general storage, boiler or furnace rooms, and maintenance shops that include woodworking and painting areas shall be protected in accordance with Section 10.2.6.8 of this IRR.
2. It is not the intent of this provision that rooms inside individual tenant spaces that are used to store routine office supplies for that tenant be required to be either separated or sprinklered.
3. High hazard contents areas. High hazard contents areas, as classified in Division 4, shall meet the following criteria:
 - a. The area shall be separated from other parts of the building by fire barriers having a fire resistance rating of not less than 1 hour, with all openings therein protected by $\frac{3}{4}$ -hour, fire protection-rated, self-closing fire door assemblies.
 - b. The area shall be protected by an automatic extinguishing system in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems.
4. The requirement for separating high hazard contents areas from other parts of the building is intended to isolate the hazard, and Section 10.2.6.8 of this IRR is applicable.
5. **Cooking Equipment.** Cooking equipment shall be protected in accordance with NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, unless the cooking equipment is one of the following types:
 - a. Outdoor equipment
 - b. Portable equipment not flue connected
 - c. Equipment used only for food warming

SECTION 10.2.14.4. BUILDING SERVICE UTILITIES

Utilities shall comply with the provisions of Section 10.2.7.1 of this IRR.

- A. **Heating, ventilating, and air-conditioning.** Heating, ventilating, and air-conditioning equipment shall comply with the provisions of Section 10.2.7.2 of this IRR.
- B. **Elevators, escalators, and conveyors,** elevators, escalators, and conveyors shall comply with the provisions of Section 10.2.7.5 of this IRR.

C. Rubbish chutes, incinerators, and laundry chutes. Rubbish chutes, incinerators, and laundry chutes shall comply with the provisions of Section 10.2.7.4 of this IRR.

SECTION 10.2.14.5 COMBINED BUSINESS AND MERCANTILE OCCUPANCY

In any building occupied for both business and mercantile purposes, the entire building shall have exits in accordance with Division 14 of this Chapter.

Exception: If mercantile occupancy sections are effectively segregated from business section, exit facilities may be treated separately.

SECTION 10.2.14.6 HIGH RISE BUILDINGS

All business occupancy buildings fifteen (15) meters or more in height shall be provided throughout with approved, supervised sprinkler system, fully electrically supervised designed in accordance with NFPA 13: Standard for the Installation of Sprinklers (latest edition); or shall be designed with a system that will provide equivalent safety. Building height shall be measured from the ground level to floor of the topmost storey.

In addition to the above requirements, all buildings regardless of height shall comply with other applicable provisions of the Fire Code of the Philippines and this IRR.

DIVISION 15. INDUSTRIAL OCCUPANCIES

SECTION 10.2.15.1 REQUIREMENTS

A. Sub – Classification of Occupancy and Occupant Load

1. Sub – Classification of Occupancy

- a. **General Industrial Occupancy.** Industrial occupancies that conduct ordinary and low hazard industrial operations conducted in buildings of conventional design suitable for various types of industrial process.

This include multi-storey buildings where floors are occupied by different tenants, or buildings suitable for such occupancy and therefore subject to possible use for types of industrial process with a high density of employee population.

- b. **Special Purpose Industrial Occupancy.** Includes industrial occupancies that conduct ordinary and low hazard industrial operations in buildings all except high hazard occupancy, designed for and suitable only for particular types of operations,

characterized by a relatively low density of employee population with much of the area occupied by machinery or equipment.

- c. **High Hazard Industrial Occupancy.** Includes industrial occupancies that use high hazard materials or processes or house high hazard contents.
- d. **Open Industrial Structures.** - Includes operations conducted in the open air as distinguished from enclosure with buildings, such as those often found in oil refining and chemical processing plants where equipment is in the open platforms used for necessary access, sometimes with roofs or canopies to provide some shelter, but no walls.

2. Occupant Load

- a. The occupant load of industrial occupancies for which exits are to be provided shall be one (1) person per nine and three-tenths square meters (9.3 m^2) gross floor area, provided that in Special Purpose Industrial Occupancy and for Open Industrial Structures, the occupant load shall be the maximum number of persons to occupy the area under any probable conditions, and further provided that in existing industrial occupancies, the Chief, BFP or his duly authorized representative may waive requirements for additional exits if the existing exits are adequate for the maximum number of persons actually employed.
- b. Every auditorium, restaurant, office, garage and medical facility in connection with industrial occupancies shall have exits in accordance with the other applicable Sections of this IRR.
- c. Exit requirements for specific occupancies shall comply with this Division.

SECTION 10.2.15.2 EXIT DETAILS

A. General

Each required exit shall be in accordance with the applicable Sections of Division 4 of this Chapter, with access thereto and ways of travel therefrom in accordance with Section 10.2.5.2 of this IRR.

B. Types of Exits

- 1. Exits shall be restricted to the following permissible types:
 - a. Doors
 - b. Stairs, or smokeproof enclosures

- c. Horizontal exits
- d. Ramps
- e. Slide Escapes

C. Minimum Corridor Width

The minimum width of any corridor or passageway serving as a required exit or means of travel to or from required exit shall be one hundred twelve centimeters (112 cm) in the clear.

D. Capacity of Exits

Capacity of means of egress shall be determined in accordance with Section 10.2.5.2 of this IRR.

E. Number of Exits

At least two (2) exits shall be provided for every floor or section, including floors below the floor of exit discharge used for industrial purposes or uses incidental thereto. At least one of which shall be reached without traversing another storey.

Exception: For rooms or areas with a total capacity of less than twenty five (25) persons having direct exit to the street or to an open area outside the building at ground level, with a total travel distance from any point of not over fifteen and one-half meters (15.5 m), a single exit may be permitted. Such travel shall be on the same floor level. If the traversing of stairs is required, there shall not be a vertical travel or more than four and six-tenths meters (4.6 m) and such stairs shall be provided with complete enclosures to separate them from any other part of the building with no door openings therein.

F. Travel Distance to Exits

1. Exits shall be as remote from other as practicable, so arranged that it will not be necessary to travel more than thirty one meters (31 m) from any point to reach the nearest exit for buildings not protected by a complete automatic fire suppression system, or forty six meters (46 m) in a building protected by an approved, supervised sprinkler system in accordance with Section 10.2.6.5 of this IRR.
2. From every point there shall be at least two (2) separate exits accessible, so arranged as to be reached by different paths of travel in different directions.

Exception: A common path of travel may be permitted for the first fifteen meters (15 m) from any point; i.e., no dead-end may be more

than fifteen and one-half meters (15.5 m) deep.

G. Discharge from Exits

A maximum of fifty (50%) percent of the exits may discharge through areas on the floor of exit discharge provided:

1. Such exits discharges to a free and unobstructed way to the exterior of the building, which way is readily visible and identifiable from the point of discharge from the exit.
2. The floor of discharge into which the exit discharges is provided with automatic fire suppression system and any other portion of the level of discharge with access to the discharge area is provided with automatic fire suppression system protection or separated from it in accordance with the requirements for the enclosure of exits (see Section 10.2.6.2 of this IRR).

Exception: If the discharge area is a vestibule or foyer with no dimension exceeding three (3) meters and separated from the remainder of the floor or discharge by construction providing protection at least the equivalent of wired glass in steel frames, and serving only for means of egress including exits directly to the outside, the requirements of Section 10.2.6.2 of this IRR may be waived.

3. The entire area on the floor of discharge is separated from areas below by construction having a minimum of two (2) hour fire-resistance rating.

H. Signs, Lighting, and Exit Signages

1. Signs designating exits or ways of travel there to shall be provided in accordance with Section 10.2.5.12 of this IRR.
2. Exit lighting shall be provided in accordance with Section 10.2.5.11 of this IRR.
3. Emergency lighting shall be provided in accordance with Section 10.2.5.11 of this IRR.

SECTION 10.2.15.3 PROTECTION

A. Protection of Vertical Openings

1. Every stairway, elevator shaft, escalator opening and other vertical opening shall be enclosed or protected in accordance with Section 10.2.6.2 of this IRR.

Exception No. 1: Unprotected vertical openings connecting not more

than three (3) storeys used for industrial occupancy only maybe permitted in accordance with the conditions of Section 10.2.6.2 of this IRR, with approved, supervised sprinkler system.

Exception No.2: In any existing building only, where provided with approved, supervised sprinkler system in accordance with Section 10.2.6.5 of this IRR, vertical openings not constituting as required means of egress may be unprotected provided, that, all required exits shall consist of smoke-proof enclosure or outside stairway in accordance with Section 10.2.5.5 or horizontal exits in accordance with Section 10.2.5.6 of this IRR.

B. Interior Finish.

Interior finish shall be Class A, Class B or Class C.

C. Detection, Alarm and Communications Systems

1. An approved automatic fire detection and alarm system shall be required on all industrial occupancies except for buildings with less than 25 employees where such building shall be equipped with manual fire alarm system.
2. Not less than one (1) fire alarm box shall be installed for buildings equipped with automatic fire detection and alarm system.
3. If buildings are equipped with approved, supervised automatic sprinkler system, the flow of water shall initiate the fire alarm system.

D. Extinguishing Requirement

1. Every high hazard occupancy shall have automatic fire suppression system protection or other equivalent protection as may be appropriate to the particular hazard, including explosion venting for any area subject to an explosion hazard, designed to minimize danger to occupants in case of fire or other emergency before they have time to utilize exits to escape.
2. Portable fire extinguishers shall be installed in accordance with Section 10.2.6.7 of this IRR.
3. Standpipe systems shall be installed in accordance with Section 10.2.6.6 of this IRR.

DIVISION 16. STORAGE OCCUPANCIES

SECTION 10.2.16.1 GENERAL STORAGE OCCUPANCIES

A. Occupancy Load

The occupant load, in number of persons for whom means of egress and other provisions are required, shall be determined on the basis of the maximum probable population of the space under consideration.

B. Exit Details

1. Types of Exits

Means of egress for storage occupancies shall be restricted to the following types:

- a. Doors
- b. Stairs and Smokeproof Enclosures
- c. Horizontal Exits
- d. Ramps
- e. Slide Escapes

2. Capacity of means of egress

The capacity of means of egress shall be determined in accordance with Section 10.2.5.2, para "C" of this IRR.

3. Number of Exits

- a. Every building or structure used for storage and every section thereof considered separately shall have at least two (2) separate means of egress, as remote from each other as practicable.

Exception: In rooms or spaces of less than one thousand three hundred ninety four square meters ($1,394 \text{ m}^2$) gross area where less than ten (10) persons may normally be present, at least one (1) means of egress shall be provided for any person employed therein.

- b. Every storage area shall have access to at least one (1) means of exit which can be readily opened, not subject to locking at any time that any persons are therein, and not dependent on any power-operated doors except where the design of the power-operated doors may be opened manually in case of power failure to permit exit travel.

4. Travel Distance to Exits

Every area used for the storage of high hazard commodities shall have an exit within twenty three meters (23 m) of any point in the area where persons may be present, except where automatic fire suppression system protection is provided, distances may be increased to thirty meters (30 m).

5. Signs, Lighting and Exit Signages

- a. Means of egress shall be installed with signs that comply with Section 10.2.5.12 of this IRR.
- b. Means of egress shall be properly illuminated in accordance with Section 10.2.5.11 of this IRR.
- c. Emergency lighting shall be provided on normally occupied areas and on component of means of egress.

SECTION 10.2.16.2 PROTECTION

A. Protection of Vertical Opening

1. Any vertical opening shall be protected in accordance with Section 10.2.6.2 of this IRR except for existing open stairs and open ramps shall be permitted where connecting only two floor levels.
2. Existing unprotected vertical opening in buildings protected throughout by approved supervised sprinkler system in accordance with Section 10.2.6.5 of this IRR, vertical openings not constituting as required means of egress may be unprotected provided, that, all required exits shall consist of smoke-proof enclosure or outside stairway in accordance with Section 10.2.5.5 or horizontal exits in accordance with Section 10.2.5.6 of this IRR.

B. Detection, Alarm and Communications Systems

1. An approved automatic fire detection and alarm system shall be required on all industrial occupancies except for buildings with ordinary or low hazard not exceeding 2,000 square meters where such building shall be equipped with manual fire alarm system.
2. Not less than one (1) fire alarm box shall be installed for buildings equipped with automatic fire detection and alarm system.
3. If buildings are equipped with approved, supervised automatic sprinkler system, the flow of water shall initiate the fire alarm system.

C. Extinguishing Requirement

1. Every high hazard occupancy shall have automatic fire suppression system protection or other equivalent protection as may be appropriate to the particular hazard, including explosion venting for any area subject to an explosion hazard, designed to minimize danger to occupants in case of fire or other emergency before they have time to utilize exits to escape.
2. Portable fire extinguishers shall be installed in accordance with Section 10.2.6.7 of this IRR.
3. Standpipe systems shall be installed in accordance with Section 10.2.6.6 of this IRR.

SECTION 10.2.16.3 SPECIAL PROVISION FOR PARKING STRUCTURES

A. General Requirements

The following provisions apply to parking structures of closed or open type, above or below ground, but not to mechanical or exclusively attendant parking facilities, which are not occupied by customers and thus require a minimum of exits. Where repair operations are conducted the exits shall comply with the rules on Industrial Occupancies, except if the parking and repair sections are effectively separated by not less than 1-hour fire resistive construction, the parking and repair sections shall be treated separately.

B. Exit Details

1. Number and Types of Exits

Every floor of every parking structure shall have access to at least two (2) separate exits. Such exits shall be provided with doors, interior stairs of smokeproof towers, outside stairs or a horizontal exit in accordance with this IRR.

Exception No. 1: In an open -type parking structure with open ramps not subject to closure, the ramp may serve in lieu of the second exit, provided the ramp discharges directly outside at the street level.

Exception No. 2. For parking structure extending only (1) floor level below the floor of exit discharge, a ramp leading directly to the outside may serve in lieu of the second exit.

2. Arrangement of and Travel Distance to Exit

- a. Exits in parking structures shall be so arranged that no point in the area will be more than forty five meters (45 m) from the nearest exit

other than a ramp on the same floor level.

Exception no. 1: travel distance may be increased to ninety one meters (91 m) for open floors of open parking structures.

Exception no 2: travel distance may be increased to sixty meters (60 m) for enclosed parking structures completely protected by an approved, supervised sprinkler system in accordance with Section 10.2.6.5 of this IRR.

- b. Exits shall be so arranged that from any point in the parking structures, the paths of travel to the two (2) exits will be in different directions, except that a common path of travel may be permitted for the first fifteen (15) meters from any point.
- c. If fuel pumps are located within any closed parking garage, exits shall be so located that travel away from the fuel pump in any direction which leads to an exit, with no dead end in which occupants might be trapped by fire or explosion at any fuel pump. Such exit shall lead to the outside of the building on the same level or down stairs: no upward travel permitted unless direct outside exits are available from that floor.

Any storey below the storey at which is being dispensed shall have exits direct to the outside via outside stairs or doors at ground level.

C. Illumination of Means of Egress

Every public space, hallway, stairway and other means of egress shall have illumination and emergency lighting facilities in accordance with Section 10.2.5.11 of this IRR.

D. Exit Marking

Signs in accordance with Section 10.2.5.12 of this IRR shall be provided for all required exits and exit access.

SECTION 10.2.16.4 SPECIAL PROVISIONS FOR AIRCRAFT HANGARS

A. Exit Details

1. Exits from aircraft storage or servicing areas shall be provided at intervals of not more than forty (40) meters on all exterior walls or aircraft hangars. There will be a minimum of two (2) exits serving each aircraft storage or servicing area. Horizontal exits through interior fire walls shall be provided at intervals of not more than thirty meters (30 m). Dwarf or "smash" doors in doors accommodating aircraft may be used to comply with these requirements. All doors designated as exits shall be kept unlocked in the direction of exit travel while the area is occupied.

2. Exits from mezzanine floors in aircraft storage or servicing areas shall be so arranged that the maximum travel to reach the nearest exit from any point on mezzanine shall not exceed twenty three meters (23 m). Such exits shall lead directly to a properly enclosed stairwell discharging directly to the exterior or to a suitably cut-off area or to outside stairs.

B. Signs

Exits signs shall be provided above all doors and exit ways in accordance with Section 10.2.5.12 of this IRR.

SECTION 10.2.16.5 SPECIAL PROVISIONS FOR GRAIN ELEVATORS

- A. In grain elevators, there shall be at least one (1) stair tower from storeys below the floor of exit discharge to the floor of exit discharge and from the floor of exit discharge to the top floor of the working house enclosed on a dust tight non-combustible shaft.
- B. Noncombustible doors of the self-closing type shall be provided at each floor landing.
- C. An exterior stair or basket ladder type fire escape accessible from all working levels of the head house that provides access to the top of the adjoining structure and that provides a continuous path to the means of egress.
- D. An exterior stair or basket ladder type fire escape accessible from all working levels of the head house that provides passage to the ground level.

DIVISION 17. MISCELLANEOUS STRUCTURES

Any building or structure occupied for purposes not covered by Division 8 through 17 of this IRR shall have exits and related safeguards in accordance with the fundamental principles of this Chapter, and shall comply with the following provisions where applicable.

SECTION 10.2.17.1 TOWERS

- A. Any tower utilized for such purposes as observation, signaling, either as an independent structure or on top of a building, shall be permitted to have a single stairway or ramp exit if all of the following conditions are met:
 1. The tower is of such size as not to be subject to occupancy by more than twenty five (25) persons at any floor level.
 2. The tower shall not be used for living or sleeping purposes.

3. The construction shall be fire-resistant, noncombustible or constructed of heavy timber. The interior finish, if any, is Class A or Class B, and there shall be no combustible materials in, under, or in the immediate vicinity of the tower except necessary furniture such as bare wooden or metal chairs or benches.
- B. In each tower where there is no occupancy below the top floor level and the conditions required by para "A" (1) through (3) above are met, stairs may be open with no enclosure required or, where the structure is entirely open, fire-escape type stairs may be used.
- C. Stairs shall be Class B for new construction. For existing towers, outside stairs or fire-escape type stairs may be allowed
- D. A tower such as a forest observation tower and a railroad signal tower, designed for occupancy only of not more than three (3) persons employed therein, may be of any type of construction, and may be served by ladders instead of stairs. However, if used for living or sleeping purposes, it shall at least comply with exit requirements of Section 10.2.12.6 for family dwellings.
- E. Utility/transmitter building shall be provided with appropriate type of automatic fire extinguishing system and, if subject to occupancy by technician/authorized personnel, automatic fire alarm system and portable fire extinguishers shall also be provided.
- F. Advertisement structures shall be made of fire-resistant materials including its signage components.

SECTION 10.2.17.2 PIERS AND WATER-SURROUNDED STRUCTURE

- A. This Section applies to water-surrounded structures or piers occupied as a place of amusement, passenger terminal or used for any purpose other than for the mooring of vessels and handling of cargo. Such piers shall be provided with means of exit from any structures thereon and to the shore appropriate to the character or occupancy of the pier in general accordance with the applicable sections of Division 8 through 17 of this IRR.
- B. Any pier so occupied, extending more than forty six meters (46 m) from the shore, shall be so arranged as to minimize the possibility that fire in or under the pier, may block escape of occupants to shore by one or more of the following measures:
 1. It must be provided with two (2) separate ways of travel to shore, by two (2) well-separated walkways or independent structures.
 2. The pier deck must be open fire-resistant and supported with non-combustible materials.

3. The pier deck must be provided with automatic fire suppression system protection for combustible structure and for superstructure, if any.
4. It should be completely open and unobstructed and is fifteen meters (15 m) in width if less than one hundred fifty two meters (152 m) long; or its width is not less than ten (10%) percent of its length if over one hundred fifty two meters (152 m) long.

C. Any building or structure surrounded by water such as a lighthouse shall have sufficient outside area of ground as on an island, or fire-resistant platform, to provide an adequate area of refuge from any fire in the structure. Means shall be available for transportation of occupants away from such structures to the shore or other places of safety such as by boat or helicopter, in case of fire or other emergency, within a reasonable period of time.

SECTION 10.2.17.3 IMMOBILIZED VEHICLE AND VESSELS

- A. Any house trailer or similar vehicle, railroad car, street car, truck or bus from which the wheels have been removed, provided with a permanent-type foundation, or otherwise fixed so that it is not mobile shall be considered as a building and shall be subject to the requirements of this Rule which are applicable to buildings of similar occupancy.
- B. Any ship, barge, or other vessel, which is permanently moored or aground and is occupied for purposes other than navigation, shall be subject to the requirements of this Rule applicable to buildings or similar occupancy.

SECTION 10.2.17.4 UNDERGROUND STRUCTURES AND WINDOWLESS BUILDINGS

A. General

1. Any area subject to occupancy by fifty (50) or more persons, from which there is no direct access to outdoors or to another area and no outside light or ventilation through windows, shall be equipped with approved, supervised automatic fire suppression system protection in accordance with Section 10.2.6.5 of this IRR.
2. Any underground structure, building, or floor area lacking direct outside access or windows and having combustible contents, interior finish, or construction, if subject to occupancy by more than one hundred (100) persons shall have automatic smoke venting facilities in accordance with Division 6 of this Chapter in addition to automatic fire suppression system protection.
3. Any underground structure or windowless building, for which no

natural lighting is provided, shall be provided with emergency lighting in accordance with Section 10.2.5.11 of this IRR.

B. Underground Structures

Where required from underground structure involving upward travel such as ascending stairs or ramps, such upward exits shall be cut off from main floor areas and shall be provided with outside smoke venting facilities or other means to prevent the exits serving as flues for smoke from any fire in the area served by the exits, thereby making the exits impassable.

C. Windowless Buildings

Every windowless building shall be provided with outside access panels on each floor level. Such panels shall be designed for use of firefighters.

DIVISION 18. OPERATING FEATURES

SECTION 10.2.18.1 GENERAL

Fire exit drills shall be conducted in coordination with the Office of the City/Municipal Fire Marshal.

A. Fire Exit Drills

1. Fire exit drills conforming to the provisions of this Division shall be regularly conducted in schools and in other occupancies where specified by the provisions of Divisions 8 through 17 of this Chapter, or by appropriate action of the City/Municipal Fire Marshal having jurisdiction over the area. The Chief, BFP or his duly authorized representative shall exercise discretion for the necessary modifications in detail of procedures to make the drills more effective for their intended purposes.
2. Fire exit drills, where required, shall be held with sufficient frequency to familiarize all occupants with the drill procedure and to have the conduct of the drill a matter of established routine.
3. Drills shall be held at unexpected times and under varying conditions to simulate the unusual conditions obtaining in case of fire.
4. Planning and conduct of drills shall be the responsibility of the management and/or owners of business establishments. Such planning and drill shall be made in consultation and coordination with the City/Municipal Fire Marshal having jurisdiction.
5. In the conduct of drills, emphasis shall be placed upon orderly evacuation under proper discipline rather than upon speed. As such, no running or horse play shall be permitted.

6. Drills shall include suitable procedures to make sure that all persons in the building, or all persons subject to the drill, actually participate.
7. Fire alarm facilities, where available, shall be used in the conduct of fire exit drills.

B. Furnishing and Decorations

1. No furnishing, decorations, or other objects shall be so placed as to obstruct exits, access thereto, egress therefrom, or visibility thereof.
2. Furnishing or decorations shall be treated with flame retardant where required by the applicable provisions of the Fire Code and this IRR.
3. No furnishing or decorations of an explosive or highly flammable character shall be used in any place of assembly or other occupancy.

C. Automatic Fire Suppression System

All automatic fire suppression systems required by this Chapter shall be continuously maintained in reliable operational condition at all times and such periodic inspections and tests shall be made to assure proper maintenance.

D. Alarm and Fire Detection Systems

1. Systems shall be under the supervision of qualified and competent persons, who shall cause proper tests to be made at specified intervals and have general charge of all alterations and additions.
2. Systems shall be tested at intervals as recommended by the City/Municipal Fire Marshal having jurisdiction.
3. Fire alarm signaling equipment shall be restored to service as promptly as possible after each test or alarm and shall be kept in normal conditions ready for operation. Equipment requiring rewinding or replenishing shall be rewound or replenished as promptly as possible after test or alarm.

E. Fire Retardant Paints

Fire retardant paints or solutions shall be reapplied at such intervals as necessary to maintain the necessary flame retardant properties.

F. Recognition of Means of Egress

Hangings or draperies shall not be placed over exit doors or otherwise located as to conceal or obscure any exit. Mirrors shall not be placed on exit doors nor in or adjacent to any exit in such a manner as to confuse the direction of exit.

G. Preventive Maintenance Record

Preventive maintenance records shall be prepared and submitted to the City/Municipal Fire Marshal every after inspection and test.

SECTION 10.2.18.2 PLACES OF ASSEMBLY

A. Drills

The employees or attendants of places of public assembly shall be trained and drilled in the duties they are to perform in case of fire, panic, or other related emergencies in order to be of greatest service in effecting the orderly exit of occupants.

B. Opens Flame Devices

No open flame lighting devices shall be used in any place of assembly.

Exception No. I: Where necessary for ceremonial or religious purposes, the City/Municipal Fire Marshal having jurisdiction may permit open flame lighting under such restrictions as are necessary to avoid danger of ignition of combustible materials or injury to occupants.

Exception No. 2: Open flame devices may be used on stages where a necessary part of theatrical performances provided that adequate precautions, satisfactory to the City/Municipal Fire Marshal having jurisdiction, are taken to prevent ignition of any combustible materials.

Exception No. 3: Gas lights may be permitted provided that adequate precautions satisfactory to the City/Municipal Fire Marshal having jurisdiction are taken to prevent ignition of any combustible materials.

C. Special Food Service Devices

Portable cooking equipment shall be permitted only as follows:

1. Equipment fueled by small heat sources which can be readily extinguished by water, such as candles or alcohol-burning equipment (including "solid alcohol") may be used. Adequate precautions satisfactory to the City/Municipal Fire Marshal having jurisdiction are taken to prevent ignition of any combustible materials.
2. Candles may be used on tables for food service if securely supported on substantial non-combustible bases, so located as to avoid danger of ignition of combustible materials and only if approved by the City/Municipal Fire Marshal having jurisdiction. Candle flames shall be protected.
3. "Flaming Sword" or other equipment involving open flames and flamed

dishes such as cherries jubilee, crepes suzette, etc., may be permitted provided that necessary precautions are taken, and subject to the approval of the City/Municipal Fire Marshal having jurisdiction.

D. Smoking

1. Smoking in places of assembly shall be regulated by the City/Municipal Fire Marshal having jurisdiction.
2. In rooms or areas where smoking is prohibited, plainly visible "**NO SMOKING**" signs shall be posted.
3. No person shall smoke in prohibited areas.
4. Where smoking is permitted, suitable ash trays or receptacles should be provided in convenient locations.

E. Decorations and Stage Scenery

1. Combustible materials shall be treated with an effective flame retardant material. Stage settings made of combustible materials shall likewise be treated with flame retardant materials.
2. Only noncombustible materials or fire retardant pressure treated wood may be used for stage scenery or props, on the audience side of the proscenium arch.
3. The City/Municipal Fire Marshal having jurisdiction over the area shall impose controls on the volume and arrangement of combustible contents (including decorations) in places of assembly to provide adequate level of safety to life from fire.

F. Seating

1. Seats in assembly occupancies accommodating more than two hundred (200) persons shall be securely fastened to the floor except together in groups of not less than three (3) or more than seven (7) and as permitted by the next paragraph. All seats in balconies and galleries shall be securely fastened to the floor, except in places of worship.
2. Seats not secured to the floor may be permitted in restaurants, night clubs, and other occupancies where the fastening of seats to the floor may be impractical; Provided, that in the area used for seating (excluding dance floors, stage, etc.), there shall be not more than one (1) seat for each one and four-tenths square meters (1.4 m^2) of net floor area and adequate aisles to reach exits shall be maintained at all times.

SECTION 10.2.18.3 EDUCATIONAL OCCUPANCIES

A. Drills

1. Fire exit drills shall be conducted regularly in accordance with the applicable provisions of the following paragraphs.
2. There shall be at least four (4) exit drills a year in consultation and coordination with the City/Municipal Fire Marshal having jurisdiction over the area.
3. Drills shall be conducted during class hours; during the changing of classes; when the school is at assembly; during the recess or gymnastic periods; etc., so as to avoid distinction between drills and actual fires. If a drill is called when pupils are going up and down the stairways, as during the time classes are changing, the pupils shall be instructed to form in line and immediately proceed to the nearest available exit in an orderly manner.
4. Every fire exit drill shall be an exercise by the school management. Teachers shall have a complete control of the class. Great stress shall be laid upon the execution of each drill in a brisk, quiet, and orderly manner. Running shall be prohibited. In case there are pupils incapable of holding their places in a line moving at a reasonable speed, provisions shall be made to have them taken care of by the more sturdy pupils, moving independently of the regular line of march.
5. BFP personnel shall be appointed to assist in the proper execution of all drills. The searching of toilets and other rooms shall be the duty of the teachers or other members of the staff.
6. As drills simulate an actual fire condition, pupils shall not be allowed to obtain anything after the alarm is sounded, even when in classrooms, which would contribute to the confusion.
7. Each class or group shall proceed to a primary predetermined point outside the building and remain there while a check is made to make sure that all are accounted for, leaving only when a recall signal is given to return to their classrooms, or when dismissed. Such points shall be sufficiently far away from the building and from each other as to avoid danger from any fire in the building, interference with fire department operations, or confusion between different classes or groups. An alternate assembly point shall be planned for and used during other drills to ensure safety of the children if and when the primary assembly point cannot be used by any reason.
8. Where necessary for drill lines to cross roadways, signs reading "**STOP! SCHOOL FIRE DRILL**" or equivalent shall be carried by assigned

personnel to the traffic intersecting points in order to stop the flow traffic during the period of the drill.

B. Signals

1. All fire exit drill alarms shall be sounded on the fire alarm system and not on the signal system used to dismiss classes.
2. Whenever any of the school authorities determine an actual fire exists, they shall immediately call the nearest fire station. At the same time, they shall try to extinguish the fire as circumstances permit.
3. In order to ensure that pupils will not return to a burning building, the recall signal shall be one that is separate and distinct from and cannot be mistaken for any other signals.

C. Child Day Care Centers

1. Fire prevention inspection shall be conducted monthly by a trained senior member of the staff. A copy of the latest inspection form shall be posted in a conspicuous place in the day care facility.
2. An approved fire evacuation plan shall be implemented at least once every two (2) months.
3. Furnishing and decorations in child day care centers shall be in accordance with the provisions of Section 10.2.18.1 of this IRR.
4. Waste baskets and other waste containers shall be made of non-combustible materials and provided with close fitting covers.
5. Child-prepared artwork and teaching materials may be attached directly to the walls but shall not exceed twenty (20%) percent of the wall area.

SECTION 10.2.18.4 HEALTH CARE OCCUPANCIES

A. Evacuation Plan and Fire Exit Drills

1. The administration of every hospital, nursing home and residential-custodial care institution shall have an approved evacuation plan for the guidance of all persons in the event of fire. Copies of such plans shall be made available to all supervisors and personnel. All employees shall be instructed and kept informed of their detailed duties under the plan. A copy of the plan shall be readily available at all times, in the telephone operator's position, or at the security center.
2. Every bed intended for use by institutional occupants shall be easily

movable under conditions of evacuation and shall be equipped with the type and size of casters to allow easy mobility, especially over elements of the structure such as expansion plates and elevator thresholds. The City/Municipal Fire Marshal having jurisdiction may make exceptions in the equipping of beds intended for use in areas limited to patients such as convalescent, self-care or psychiatric patients.

3. Fire exit drills in hospitals shall include the transmission of a fire alarm signal and simulation of emergency fire conditions except that the movement of infirm or bed-ridden patients to safe areas or to the exterior or the building is not required. Drills shall be conducted quarterly on each shift to familiarize hospital personnel (nurses, interns, maintenance personnel and administrative staff) with signals and emergency action required under varied conditions.

SECTION 10.2.18.5 RESIDENTIAL OCCUPANCIES

A. Hotel Emergency Organization

1. All employees of hotels shall be instructed and drilled in the duties they are to perform in case of fire, panic, or other related emergencies.
2. Drills of the hotel emergency organization shall be held twice a year covering such points as the operation and maintenance of the available first aid fire appliances, the testing of guest alerting devices, and a study of instruction for emergency duties.

B. Dormitories, Lodging and Rooming Houses

Fire exit drills shall be regularly conducted at least twice a year.

SECTION 10.2.18.6 MERCANTILE, BUSINESS, AND INDUSTRIAL OCCUPANCIES

In every mercantile, business and industrial occupancies subject to occupancy with fifty (50) or more persons, fire exit drills shall be held at least twice a year.

DIVISION 19. SPECIAL PROVISION FOR HIGH RISE BUILDINGS

SECTION 10.2.19.1 SCOPE

This Division deals with life safety from fires and similar emergencies in high rise buildings. It covers fire safety features in construction and protection of exits and passageways, and provisions for fire protection.

SECTION 10.2.19.2 DEFINITION

A high rise building is one in which the distance between the floor of the

topmost storey and the ground level is fifteen meters (15 m) or more. Building height shall be measured from the lowest level of fire department vehicle access to the floor of the highest occupiable storey.

SECTION 10.2.19.3 SMOKE CONTROL

High rise buildings shall be designed in such a manner that the levels of smoke concentration in protected spaces can be maintained within values that can be tolerated by occupants. The protected spaces shall include stairwells, at least one elevator shaft, and floor spaces readily accessible to all occupants and large enough to accommodate them. In the spaces to which the requirement for control of smoke level applies, the atmosphere shall not include more than one (1%) percent by volume of the contaminated atmosphere emanating from the fire area.

SECTION 10.2.19.4 SPRINKLER SYSTEMS PROTECTION

High rise buildings shall be protected with approved, supervised sprinkler systems designed and installed in accordance with NFPA 13, Standard for Installation of Sprinkler Systems. The approved, supervised sprinkler systems must protect all floor spaces including every closet and concealed spaces and plenums of certain configuration and construction – particularly where combustible materials are located such as exposed electrical wiring, combustible duct work, and combustible sound/thermal insulation. The system shall be interconnected to a fire command center of the building.

SECTION 10.2.19.5 FIRE COMMAND CENTER

A. For buildings ten (10) storeys or more, a fire command center shall be provided in a location approved by the City/Municipal Fire Marshal having jurisdiction and shall contain the following features:

1. The emergency voice/alarm communication system unit must have the following features:
 - a. Provide a predetermined message to the fire area where the alarm originated, actuated by a smoke detector, sprinkler head, water flow device, or manual fire alarm. The message must provide applicable information and directions to occupants.
 - b. The fire department two-way communication system must operate between the fire command center and every elevator, elevator lobby, exit stairway, and exit access corridor. A telephone station or jack shall be provided in each fire pump room.
2. The fire department communication unit.
3. Fire detection and alarm system annunciator unit

4. Elevator floor location and operation annunciator.
5. Sprinkler valve and water flow display panels.
6. Emergency generator supervision devices, manual start and transfer features. Emergency power must be available within ten (10) seconds to operate the following:
 - a. Emergency voice/alarm communication systems.
 - b. Fire alarm systems.
 - c. Automatic fire detection systems.
 - d. Elevator car lighting.
 - e. Escape route lighting.
 - f. Exit sign illumination.
 - g. Stairway doors
7. Controls for unlocking stairway doors simultaneously.
8. Telephone for fire department use with controlled access to the public telephone system.
9. Fire pump status indicators.
10. Status indicators and controls for air handling systems.
11. The fire fighters control panel for smoke control systems.
12. Emergency power and standby power status indicators.
13. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, firefighting equipment and fire department access.
14. Public address system, where specifically required by other rules of this code.

B. Shut off valves and water flow devices at the riser connection must be provided on each floor. Combined sprinkler/standpipe systems must have an individual control valve and check valve at each sprinkler connection.

SECTION 10.2.19.6 STAIRWELLS

- A. All stairwells shall be enclosed and protected in accordance with Rule 3. All doors on stairwells shall be kept closed. Stairway doors, which can be locked, must be provided with automatic electrical unlocking from the fire command center.
- B. All interior stairwells used as a means of egress shall be pressurized. In no

case shall stairwells in high rise buildings be allowed to be unprotected.

SECTION 10.2.19.7 FIRST-AID PROTECTION

- A. In addition to the other requirements of this Code, each floor shall be provided with at least thirty eight (38) to nineteen (19) millimeters lightweight flexible hose equipped with a spray nozzle and connected to the wet standpipe system or other water supply capable of providing nineteen (19) to thirty eight (38) liter per minute of water for a period of thirty minutes.
- B. Portable fire extinguisher installed in accordance with Section 10.2.6.7 shall be provided.

SECTION 10.2.19.8 APPLICABILITY OF ALL OTHER PROVISIONS OF THIS CODE

This Section shall supplement all other applicable provisions of the Fire Code and this IRR.

DIVISION 20. AERODROME FACILITIES

SECTION 10.2.20.1 GENERAL FIRE SAFETY REQUIREMENTS

- A. The BFP shall conduct regular and periodic fire safety inspection on all Aerodrome facilities.
- B. No dispensing, transfer or storage of flammable or combustible liquids shall be permitted within aerodrome facilities, except as provided in Section 10.3.4.2.1 of this IRR.
- C. Flammable and combustible liquid and fuel shall not be dispensed into or removed from the fuel system of an aircraft within any aircraft hangar, a container, tank, vehicle or aircraft except in locations approved by the City/Municipal Fire Marshal having jurisdiction.
- D. The application of flammable and combustible liquid finishes shall be done only in locations approved by the City/Municipal Fire Marshal having jurisdiction.
- E. No person shall clean any aircraft engines or parts of an aircraft in an aircraft hangar nor within fifteen meters (15 m) of another aircraft, building or hangar with any flammable liquid having a flash point under thirty seven and eight-tenths degree Celsius (37.80°C).
- F. In case of spills on Aerodrome Facilities, the following shall be observed:
 - I. All activities in the affected area not related to the mitigation of the spill shall cease until the spilled material has been removed or the hazard has been mitigated.

2. No aircraft or other vehicles shall be moved through the spill area until the spilled material has been removed or the hazard has been mitigated.
3. Spills shall be reported immediately to the City/Municipal Fire Marshal having jurisdiction, documented and mitigated.

G. Every aircraft hangar shall be equipped and maintained with metal drip pans under the engines of all aircraft stored or parked thereon.

H. No open flame, flame-producing device, or other source of ignition shall be permitted in any hangar, except in locations approved by the City/Municipal Fire Marshal having jurisdiction.

I. “**NO SMOKING**” signs with white letters at least ten centimeters (10 cm), high upon a red background shall be posted conspicuously throughout every aircraft hangar and each fuel transfer point except in approved designated and posted locations where smoking is permitted.

J. Smoking equipment such as cigarette lighters and ash trays shall be prohibited in aircraft-fueling vehicles.

K. No person shall run the engine of any aircraft in any aircraft hangar except in approved engine test area.

L. All repairing of aircraft requiring the use of open flames, fire-producing devices or the heating parts above two hundred sixty degrees Celsius (260°C) shall be done in the open or in a room separated from any hangar or other building by a fire resistive construction having fire resistance rating of not less than two (2) hours.

M. Storage of flammable and combustible or other hazardous materials in an aircraft hangar shall be prohibited, except in locations and containers approved by the City/Municipal Fire Marshal having jurisdiction.

N. Portable fire extinguishers shall be installed as follows:

1. Every vehicle used for towing aircraft and every welding apparatus shall be equipped with at least one (1) fire extinguisher having a minimum 4-B-C classification.
2. Every aircraft refueller shall be equipped with a minimum of two (2) B-C Fire extinguishers. The fire extinguisher shall be readily accessible from either side of the vehicle.
3. At every aircraft service station, including heliports, there shall be at least one fire extinguisher having a minimum 6-B-C classification, and

shall be so located that no pump or dispenser shall be more than twenty three (23) meters from such extinguisher.

O. All pumps of a positive displacement type shall be provided with a bypass relief valve set at a pressure of not more than thirty-five (35) percent in excess of the normal working pressure of the unit. Such unit shall be equipped and maintained with a pressure gauge on the discharged side of the pumps.

P. Dispensing Hose and Nozzle shall conform to the following:

1. Only hose designed for the transferring of hydrocarbon liquids shall be permitted.
2. The length of the hose shall be limited to the actual needs of the individual transfer apparatus. Such hose shall be equipped with an approved shut-off nozzle. Fuel transfer nozzles shall be of self closing type, designed to be actuated by hand pressure only. No notches or other devices shall be used for holding the nozzle valve handle in an open position. Such nozzle shall be equipped with a grounding cable complete with proper attachment for the aircraft to be serviced.

Q. Electrical wiring, switches, lights and any other source of ignition, when located in compartment housing piping, pumps, air eliminators, water separators, hose reels and the like shall be enclosed in a vapor-tight housing. Any electric motor located in such a compartment shall be of a type approved for use in hazardous locations as specified in the Philippine Electrical Code

R. Compartments housing piping and the like, pumps, air eliminators, water separators, hose reels, shall be adequately ventilated at floor level or within the floor itself.

S. Accessory Equipment shall conform to the following:

1. Ladders constructed from non-combustible material may be used with, or attached to any aircraft refueller unit; Provided that the manner of attachment or use of such ladder is approved and shall not in any occasion constitute any additional fire or accident hazard in the operation of such refueller unit.
2. Hose reels used in connecting with any such refueller unit shall be constructed of noncombustible materials and shall be provided with a pacing gland or other device which will preclude fuel leakage between such reel and fuel manifold in connection therewith.
3. Similar accessory equipment shall be of approved type

T. Bonding and Grounding shall be as follows:

1. Every transfer apparatus shall be metallically interconnected with the tank, chassis, axles and springs of every aircraft refueller unit.
2. Every aircraft refueller unit shall be provided and maintained with a substantially heavy ground cable of sufficient length to be bonded to the aircraft to be serviced. Such cable shall be metallically connected to the transfer apparatus of chassis of the aircraft refueller unit on one end and shall be provided with a suitable metal clamp on the other end, to be fixed to the aircraft.
3. The ground cable shall be bare or have a transparent protective sleeve and be carried on a reel or in a compartment for no other purpose in such a manner that it will not be subjected to sharp kinks or accidental breakage under conditions of general use.

SECTION 10.2.20.2 REFUELLER UNITS

A. Design and Construction of Aircraft Refuellers shall conform to the following:

1. Tanks and vehicles shall be designed and constructed in accordance with NFPA 385, "Tank Vehicles for Flammable Liquids," and NFPA 407, Part IV, "Aircraft Fuel Servicing Tank Vehicles."
2. Every aircraft refueller unit shall be equipped and maintained with an approved transfer apparatus.
 - a. If such transfer apparatus is operated by an individual unit of internal combustion motor type, such power unit shall be located as remotely as practicable from any pumps, piping, meters, air eliminators, water separators, hose reels, etc., and shall be housed in separate compartment from any aforementioned items; the fuel tank in connection therewith shall be suitably designed and installed and the maximum capacity shall not exceed nineteen (19) liters when such tank is installed on any such engine or in any compartment housing any such engine. The exhaust pipe, muffler and tail pipes shall be shielded.
 - b. If operated with gears or chains, the gears, chains, shafts, bearings, housing and all parts thereof shall be of an approved design and shall be installed in a workmanlike manner and so maintained.
 - c. Flexible connections for the purpose of eliminating vibration may be permitted if the material used therein is designed, installed and maintained in an approved manner and provided such connections do not exceed sixty one (61) centimeters in length.

B. Operations, Maintenance and Use of Aircraft Refueller Units shall conform to the following:

1. In addition to all other applicable provisions of this Code, the following regulations shall apply to the operations, maintenance, and use of aircraft refueller units.

a. Aircraft-fueling vehicles and all related equipment shall be properly maintained and kept in good working condition. Accumulations of oil, grease, fuel and other flammable or combustible materials are prohibited. Maintenance and servicing of such equipment shall be accomplished in approved areas.

Minor adjustment and repairs may be made when necessary to move such units to the storage locations when failure occurs elsewhere on the airport or heliport.

b. Tanks, pipes, hoses, valves and other fuel delivery equipment shall be maintained leak free at all times.

c. Aircraft-fueling vehicles and related equipment which are in violation of this rule shall be immediately defueled and removed from service and shall not be returned to service until proper repairs have been made.

d. Aircraft-fueling vehicles that are operated by a person, firm or corporation other than the permittee's authorized employee shall be provided with a legible sign visible from outside the vehicle showing the name of a person, firm or corporation operating such unit and signage conforming with.

C. Fueling and Defueling shall conform to the following:

1. Aircraft refueller units shall not be located, parked, or permitted to stand under any portions of an aircraft nor in any position where such unit could obstruct egress from aircraft should fire occur during fuel transfer operations.

2. Every aircraft refueller unit shall be electrically bonded to the aircraft being fueled or defueled and either the aircraft refueller unit or the aircraft shall be adequately grounded in approved manner. A drag chain and flexible ground conductor shall not be deemed to fulfill the requirements of this Section for grounding during fuel transfer.

3. Transfer nozzle shall be equipped with approved bonding conductors which shall be clipped or otherwise positively engaged with the bonding attachment provided on the aircraft adjacent to the fuel tank cap.

4. All bonding and ground connections required by this section shall be made prior to any fuel transfer and shall not be disconnected until fuel transfer operations are completed.
5. During fuel transfer operations, qualified persons shall be in immediate control of each transfer nozzle and fuel pumping equipment to shut off or otherwise control the flow of fuel from the time fuelling operations have begun until they are completed except for under wing refueling
6. Fuel transfer nozzle shall not be held in the open position by any device other than by direct hand pressure by the operator.

D. Aircraft refueller unit shall be attended and operated only by qualified personnel. Each qualified operator shall be required to carry his identification card and to submit documents issued by the employer certifying his qualifications to the BFP.

E. The fuel transfer hoses shall be properly placed on the approved reels, or in the compartment provided, or may be stored on top decking of refuellers; provided that rails of proper height are provided for security and protection of such equipment before any aircraft refueller unit is moved. Such transfer hose shall not be looped or dropped over any part of the refueller unit nor shall fuel transfer hose be dragged when such refueller unit is moved from fueling unit to another.

F. Maintenance of Refuelling Units shall conform to the following:

1. Every aircraft refueller unit and all equipment shall be maintained in a safe operating condition and in good repair at all times.
2. On finding any aircraft servicing equipment which is in use for fuelling operations to be defective or in a state of disrepair, and by reason of such defect or disrepair, the use of such aircraft servicing equipment constitutes an undue fire hazard, the City/Municipal Fire Marshal having jurisdiction shall order the use of such equipment discontinued until such repairs, replacements or such changes are made as necessary to render the same safe for continued use. No person shall use any such defective equipment until the same is rendered safe by the City/Municipal Fire Marshal.

G. Loading and Unloading shall conform to the following:

1. Aircraft refueller units shall be loaded only at an approved loading rack, except that when refueling aircraft, such unit may be loaded from the fuel tanks or the aircraft.

- 2. The fuel cargo of any such unit shall be unloaded only by approved transfer apparatus into the fuel tanks of aircrafts, underground storage tanks or approved gravity storage tanks.
- H. Passenger may be loaded aboard an aircraft during the time fuel transfer operations are in progress provided that the following provisions are strictly enforced:
 - 1. No person shall smoke or produce any open flame in the cabin of the aircraft or in the outside thereof within fifteen meters (15 m).
 - 2. A qualified employee of the air vehicle owner shall be responsible for ensuring that the passengers are not allowed to smoke when aboard the aircraft, nor while going across the ramp from the gate to such aircraft or vice-versa.
 - 3. Passengers shall not be permitted to linger about the plane but shall proceed directly from the loading gate and the aircraft, and vice-versa.
 - 4. Passenger loading stands shall be left in loading position until all fuel transfer operations are completed.
 - 5. Fuel transfer operations shall not be performed on the main exit side of any aircraft containing passengers.
- I. No smoking or open flames shall be allowed within fifteen meters (15 m) from the point where fuel is being transferred nor shall any electrical or motor driven devices be connected from any aircraft at any time while refueling operations are in progress on such aircraft.

SECTION 10.2.20.3 HELISTOPS

- A. Approval must first be obtained from the Civil Aviation Authority of the Philippines and City/Municipal Fire Marshal having jurisdiction before any helistops can be operated.
- B. The touchdown area shall be surrounded on all sides by a clear area having a minimum average width of the roof level of four and six-tenths meters (4.6 m) with no width less than one and a half meters (1.5 m).
- C. Landing areas on the structures shall be so maintained as to confine any flammable liquid spillage to the landing area itself and shall be made to drain such spillage away from any exit or stairway.
- D. Exit and stairways from helistops shall be maintained in accordance with the Section 10.2.5.2 of this IRR except that all landing areas located on building or structures shall have two or more exits. For landing platforms or

roof areas less than eighteen and three-tenths meters (18.3 m) in length, or less than one hundred eighty six square meters (186 m²) in area, the second exit may be a fire escape stair conforming to Section 10.2.5.10.

CHAPTER 3. FIRE SAFETY FOR HAZARDOUS MATERIALS

DIVISION 1. SCOPE

SECTION 10.3.1.1 APPLICABILITY

This Chapter shall apply to materials and chemicals which are:

- A. Highly flammable that may react to cause fires or explosions; or
- B. By their presence may create a fire or explosion hazard; or
- C. Their toxicity, flammability, or reactivity, render fire fighting dangerous; or
- D. Flammable or combustible liquids which are chemically unstable and which may spontaneously form explosive compounds; or
- E. Flammable or combustible liquids which undergo spontaneous reactions of explosive violence or with sufficient evolution of heat to be a fire hazard.

SECTION 10.3.1.2 HAZARDOUS MATERIALS AND CHEMICALS

Hazardous materials and chemicals shall include, but not limited to:

- 1. flammable solids;
- 2. corrosive liquids;
- 3. radioactive materials;
- 4. oxidizing materials;
- 5. potentially explosive chemicals;
- 6. highly toxic materials; and
- 7. poisonous gases.

DIVISION 2. FIRE SAFETY CLEARANCE

- A. In addition for the issuance FSIC, a Fire Safety Clearance shall be issued by the BFP as prerequisite for the issuance of appropriate permits and licenses from the local governments and other government agencies concerned, for the following:

- 1. Installation and storage of:

- a. Nitrocellulose Nitrate Plastic (Pyroxylin)
- b. Combustible Fibers
- c. Combustible Commodities
- d. Matches
- e. Magnesium
- f. Flammable and Combustible Liquids
- g. Liquefied Petroleum Gas (LPG)
- h. Medical and Related Compressed Gas
- i. Cryogenic
- j. Other hazardous materials and chemicals

2. Transportation or conveyance of:

- a. Matches
- b. Flammable and Combustible Liquids
- c. Liquefied Petroleum Gas (LPG)
- d. Medical and Related Compressed Gas
- e. Cryogenic
- f. Other hazardous materials and chemicals

3. Disposal or abandonment of:

- a. Tanker and vessel for flammable and combustible liquids
- b. Containers of all types of compressed gases
- c. Other hazardous materials and chemicals

DIVISION 3. GENERAL REQUIREMENTS

- A. The manufacture, storage handling and use of hazardous materials and chemicals shall be safeguarded with protective facilities or devices as public safety may require.
- B. The City/Municipal Fire Marshal having jurisdiction shall require the separation or isolation from other storage occupancies or buildings of any chemical that, in combination with other substances, may bring about a fire or explosion or may liberate a flammable or poisonous gas.
- C. Defective containers shall be disposed of or repaired in accordance with recognized safety practices. No spilled materials shall be allowed to accumulate on floors or shelves.
- D. Where stored for retail, storage shall be neat and orderly.
- E. Where no specific requirements have been established, storage, handling, and use of hazardous chemicals shall be in accordance with internationally recognized good practice.

F. All hazardous chemicals as defined in this Chapter shall bear especially designed and color coded labels consisting of four diamonds arranged into one large diamond with the first, indicating the toxicity and health hazards; the second, its flammability; the third, its reactivity; and the fourth, fire-fighting and first aid instructions.

DIVISION 4. SPECIFIC REQUIREMENTS

SECTION 10.3.4.1 SOLID

Hazardous solid materials are classified according to: (1) flexible materials such as textiles and cushioning; and (2) structural materials, which can include everything from steel and concrete to wood and synthetic structural plastic foams. The fire hazards posed by inorganic structural materials are most likely to be passive.

SECTION 10.3.4.1.1 CELLULOSE NITRATE PLASTIC (PYROXYLIN)

All raw cellulose nitrate plastic (pyroxylin) materials shall be stored, handled, protected and displayed as follows:

A. On Storage and Handling

1. Cellulose Nitrate in excess of ten kilograms (10 kg) shall be stored in a vented cabinet or vented and sprinklered vault.
2. The maximum weight of raw materials to be stored in a cabinet shall be two hundred twenty five kilograms (225 kg) with two (2) compartments equally divided.
3. The maximum weight of raw materials to be stored in a workroom shall be four hundred fifty kilograms (450 kg).
4. All raw materials in excess of four hundred fifty kilograms (450 kg) shall be stored in a vented vault with a capacity not exceeding forty two cubic meters (42 m^3) with one (1) automatic sprinkler head for every three and five tenths cubic meters (3.5 m^3) of the total vault space;
5. Cellulose Nitrate Plastic (Pyroxylin) shall not be stored in any room or compartment or within one meter (1 m) from any heat producing appliances such as but not limited to steam pipes, radiators, chimneys, stove, torch, forge, flame, fire or electric, or similar equipment likely to produce spark.
6. In factories, operators working in a work room using cellulose nitrate plastic (pyroxylin) shall be stationed at least one meter (1 m) apart, and the amount of material per operator shall not exceed one-half (1/2) day supply and be limited to three (3) tote boxes.

7. All waste cellulose nitrate plastic (pyroxylin) materials such as shavings, chips, turnings, sawdust, edging and trimmings shall be stored under water in metal receptacles until removed from the premises.
8. Smoking shall be strictly prohibited in any building or establishment where cellulose plastic (pyroxylin) are stored, displayed or manufactured. A "**NO SMOKING**" sign shall be posted in conspicuous places.
9. The storage area of cellulose nitrate plastic (pyroxylin) shall be marked with a sign that states: "**NITROCELLULOSE — FLAMMABLE SOLID — KEEP HEAT, SPARKS, AND FLAME AWAY**" or equivalent wording.

B. On Fire Protection

1. All new and existing buildings or any portion thereof including factories used for the manufacture or storage of articles of cellulose nitrate plastic (pyroxylin) in quantities exceeding forty five kilograms (45 kg) shall be equipped with an approved, supervised sprinkler system and the storage area shall be constructed of fire resistive materials with two hour (2-hr) fire resistance rating. The structural elements shall be of steel, iron, concrete or masonry construction.
2. First aid fire protection equipment/appliances shall be installed in buildings where storing, handling and displaying of cellulose nitrate plastic (pyroxylin) is conducted.

C. On Display

In stores or establishments, displays of cellulose nitrate plastic (pyroxylin) articles shall be in show cases or show windows.

Exception:

1. Articles may be displayed and placed on tables, provided that:
 - a. It is over ninety centimeters (90 cm) apart;
 - b. If displayed on counters, such counters shall be arranged in the following manner:
 - i. Each table shall measure one meter (1 m) wide and three meters (3 m) long;
 - ii. The space beneath each table or counter shall be free of storage or obstruction of any kind;
 - iii. The display tables shall be arranged and located so as not to obstruct the passage to exits in the event of emergency;

- c. Lights shall not be located directly above any cellulose nitrate material or storage, unless the light fixture is provided with a suitable guard to prevent heated particles from falling.

D. Fire Safety Clearance

A Fire Safety Clearance for the storage of cellulose nitrate or cellulose nitrate plastic (pyroxylin) shall be obtained from City/Municipal Fire Marshal having jurisdiction.

SECTION 10.3.4.1.2 COMBUSTIBLE FIBERS

All combustible fibers shall be stored, handled and protected as follows:

A. On Storage and Handling

1. Common Requirements:

- a. Combustible fibers shall not be stored in rooms or buildings with hazardous gases, flammable liquids, dangerous chemicals or other similar materials.
- b. Trucks or automobiles shall not enter any fiber storage room or building. They shall however be allowed to enter at loading platforms. All forklifts, vehicles and equipment used within combustible fibers storage areas shall be equipped with flash or spark suppressors or arresters.
- c. Smoking, open flame, and hotworks, shall not be permitted in any area where combustible fibers are handled or stored. A "NO SMOKING" sign shall be posted.
- d. Agricultural products such as, but not limited to, straw and hay shall not be stored adjacent to buildings of combustible materials unless a clear distance equal to the height of the pile is maintained.
- e. Storage shall be limited to stocks of one hundred (100) metric tons. A fire resistive wall with a fire resistance rating of two (2) hours or a clear space of six meters (6m) shall be maintained between stacks.
- f. A one meter (1m) clearance shall be maintained between sprinkler pipes in protected storage vaults and top of the piles.

2. Specific Requirements for Loose Combustible Fibers

- a. Loose combustible fibers shall be stored as shown in the Table 14 below.

Table 14: STORAGE OF COMBUSTIBLE FIBERS

Volume of Material in cubic meters (m^3)	Method of Storage
0 – 3	Combustible Fiber Storage Bin* with self-closing cover
3.1 – 14	Combustible fiber storage room having 1-hr fire resistance barrier
14.1 – 28	Combustible fiber storage vault having 2-hr fire resistance barrier and approved opening
28 up (protected)	Combustible fiber storage vault with approved opening and protected by approved, supervised sprinkler system

* Quantities of loose combustible fiber up to 3 cubic meters ($3m^3$) shall not be kept in any building unless stored in a metal or metal-lined bin equipped with a self-closing cover.

- b. Loose combustible fiber exceeding twenty eight cubic meters ($28 m^3$) but not more than seventy cubic meters ($70 m^3$) may be stored in a "loose house" or detached structure with opening properly protected against sparks and shall not be used for any other purpose.

3. Specific Requirements for Baled Combustible Fibers

- a. A single block or pile shall contain a maximum of seven hundred cubic meters ($700 m^3$) of baled fiber.
- b. Each block or pile shall be separated from the adjacent storage by an aisle measuring not less than one hundred fifty centimeters (150 cm) wide or by barriers consisting of continuous sheets of non-combustible material extending from the floor to a height of at least thirty centimeters (30cm) beyond the topside of the piles.
- c. Fibers in bales bound with combustible tie ropes, as well as jute and other fibers liable to swell when wet shall be stored to allow for expansion in any direction and shall have one meter (1m) clearance from walls to piles.
- d. If the storage compartment is less than nine meters (9 m) in width, there shall be a forty five centimeters (45 cm) clearance from walls to piles and a center aisle of not less than one hundred fifty centimeters (150 cm) width is maintained.

B. On Fire Protection

1. Portable fire extinguishers shall be installed as required for extra-hazard occupancy protection in accordance to NFPA 10, "Standard for Portable Fire Extinguishers".

C. Fire Safety Clearance

A Fire Safety Clearance from City/Municipal Fire Marshal having jurisdiction shall be obtained for the storage of combustible fiber.

SECTION 10.3.4.1.3 COMBUSTIBLE COMMODITIES

In the storage of combustible commodities, the following factors shall be considered:

1. method and height of stock piling;
2. combustibility of materials;
3. fuel load and rate of spread;
4. areas and size of piles;
5. aisle ways;
6. water supply;
7. sprinkler protection;
8. building construction, including height and area;
9. draft curtains;
10. roof vents; and
11. fire separations.

A. Storage and Handling

1. Common Requirements:

- a. Storage of combustible commodities to include permanent partition of walls and ceilings shall be of fire resistive materials such as steel, iron, concrete, or masonry construction;
- b. There shall be roof vents installed in each building or portion thereof with a minimum dimension of not less than one hundred twenty centimeters (120 cm).
- c. In lieu of roof vents, a perimeter venting in the exterior wall in the form of windows may be installed within twenty-three meters (23m) from the exterior wall. The upper portion of that window shall be located thirty-one centimeters (31cm) from the roof or ceiling level. The window opening shall not be less than seven hundred sixty two millimeters (762 mm) in height and one hundred fifty centimeters (150 cm) wide. Venting shall be in accordance with the following table:

Table 15: STANDARDS OF VENTING FOR THE STORAGE AND HANDLING OF COMBUSTIBLE COMMODITIES

HAZARD CLASSIFICATION	VENT AREA TO FLOOR AREA RATIO	MAXIMUM SPACING BETWEEN VENT CENTERS
Low	14.00	50 meters
Average	9.30	40 meters
High	4.70	30 meters
Very High	2.80	23 meters

- d. Vents shall consist of automatic roof vents equipped with a fusible link designed to release prior to sprinkler operation, or roof openings covered with approved plastic that will melt when heated and drop out prior to sprinkler operation. Windows shall be equipped with single thickness glass or plastic panels.
- e. Aisles separating combustible commodities shall be not less than two hundred forty centimeters (240 cm) in width. Aisles separating commodities more than six meters (6m) in height shall be not less than three meters (3m) in width. Main aisles shall be located beneath draft curtains. Stock piles shall not extend beyond or beneath a draft curtain. Aisles not less than one thousand one hundred eighteen millimeters (1,118 mm) in width shall be established to provide access to exits and firefighters' access doors. Aisles shall be kept clear of storage, waste materials and debris at all times.
- f. Firefighters' access door, aisles and exit doors shall not be obstructed. Access shall be provided at ground level for firefighting. There shall be at least one (1) door not less than two meters (2 m) in height for each thirty lineal meters (30 m). Metal roll-up doors are not allowed for such purpose.
- g. The structural integrity of racks shall be maintained. Clearance between ignition sources, such as light fixtures, heaters and flame-producing devices, and combustible materials shall be maintained. Smoking shall be prohibited and a "NO SMOKING" sign shall be posted in conspicuous places.

2. Factors to be considered in the storage of common commodities:

a. **Method and Height of Stock Piling**

- i. **Bulk storage** - consists of piles of loose, free-flowing materials, including powder, granules, pellets, or flakes, and agricultural items. The commodities are typically stored in silos, bins, tanks, or in large piles on the floor.
- ii. **Solid piling** - consists of cartons, boxes, bales, bags, etc., in direct contact with each other. Air spaces or flues exist only

where contact is imperfect, or where a pile is close to, but not touching, another pile. Because pallets are not typically used, stacking is done by hand or by lift trucks using side clamps or prongs, which are pried between packages or bales without damaging the product.

- iii. **Palletized storage** - consists of unit loads placed on pallets that are then stacked on top of one another. A pallet load usually takes the form of a cube, with dimensions about one hundred twenty to one hundred fifty centimeters (120 cm to 150 cm) in height, and consists of a single or multiple package(s). The top surface of the pallet load must adequately support other pallet loads so that the commodity would not be crushed or the pile would not become unstable. Due to these considerations, the maximum height of palletized storage shall not exceed nine hundred ten centimeters (910 cm)
- iv. **Rack storage** – is a structural framework in which the commodity is placed usually as a pallet load. The design of rack storage systems maximizes vertical storage capacity. The ceiling height or the vertical reach of material handling equipment limits storage heights. Some rack storage arrangements are over thirty meters (30m) high.
 - iv.a. Single row racks include racks up to one hundred eighty centimeters (180 cm) wide, separated from other storage by at least one meter (1m) aisles.
 - iv.b. Double row racks consist of two single row racks placed back to back with a combined width of up to three hundred seventy centimeters (370 cm) and aisles at least one meter (1m) wide on each side.
 - iv.c. Multiple row racks utilize a flow through or drive in configuration. They consist of racks greater than three hundred seventy centimeters (370 cm) wide, or single or double row racks separated by aisles less than one meter (1m) wide, with overall width exceeding three hundred seventy centimeters (370 cm).

b. **Combustibility of Materials**

i. **Commodity Classification**

The following classification of commodities shall be used as a guide in determining sprinkler, venting, aisle spacing and other fire safety requirements for high piled storage:

- i.a. **Class I commodities** are essentially noncombustible products on wooden or non-expanded polyethylene solid

deck pallets, in ordinary corrugated cartons with or without single-thickness dividers, or in ordinary paper wrappings with or without pallets. Class I commodities are allowed to contain a limited amount of Group "A" plastics. Examples of Class I commodities include, but are not limited to, the following:

- Alcoholic beverages, with not exceeding 20-percent of alcohol
- Appliances noncombustible, electrical
- Cement in bags
- Ceramics
- Dairy products in non wax-coated containers (excluding bottles)
- Dry insecticides
- Foods in noncombustible containers
- Fresh fruits and vegetables in non-plastic trays or containers
- Frozen foods
- Glass
- Glycol in metal cans
- Gypsum board
- Inert materials, bagged
- Insulation, noncombustible
- Noncombustible liquids in plastic containers having less than a 5-gallon (19 ℥) capacity
- Noncombustible metal products

i.b. **Class II commodities** are Class I products in slatted wooden crates, solid wooden boxes, multiple-thickness paperboard cartons or equivalent combustible packaging material with or without pallets. Class II commodities are allowed to contain a limited amount of Group "A" plastics. Examples of Class II commodities include, but are not limited to, the following:

- Alcoholic beverages, with not exceeding 20-percent alcohol, in combustible containers
- Foods in combustible containers
- Incandescent or fluorescent light bulbs in cartons
- Thinly coated fine wire on reels or in cartons

i.c. **Class III commodities** are commodities of wood, paper, natural fiber cloth, or group C plastics or products thereof, with or without pallets. Products are allowed to contain limited amounts of Group "A" or "B" plastics, such as metal bicycles with plastic handles, pedals, seats and tires.

Examples of Class III commodities include, but are not limited to, the following:

- Combustible fiberboard
- Cork, baled
- Feeds, bagged
- Fertilizers, bagged
- Food in plastic containers
- Furniture: wood, natural fiber, upholstered, non-plastic
- Wood or metal with plastic-padded and -covered arm rests
- Glycol in combustible containers not exceeding 25 percent
- Lubricating or hydraulic fluid in metal cans
- Lumber
- Mattresses, excluding foam rubber and foam plastics
- Noncombustible liquids in plastic containers having a capacity of more than 5 gallons (19 l)
- Paints, oil base, in metal cans
- Paper, waste, baled
- Paper and pulp, horizontal storage, or vertical storage that is banded or protected with approved wrap
- Paper in cardboard boxes
- Pillows, excluding foam rubber and foam plastics
- Plastic-coated paper food containers
- Plywood
- Rags, baled
- Rugs, without foam backing
- Sugar, bagged
- Wood, baled
- Wood doors, frames and cabinets
- Yarns of natural fiber and viscose

i.d. **Class IV commodities** are class I, II or III products containing Group "A" plastics in ordinary corrugated cartons, and class I, II and III products with group "A" plastic packaging with or without pallets. Group "B" plastics and free-flowing Group "A" plastics are also included in this class. Examples of Class IV commodities include, but are not limited to, the following:

- Alcoholic beverages, with more than 20-percent but less than 80-percent alcohol, in cans, bottles, or cartons.
- Clothing, synthetic or non-viscose
- Combustible metal products (solid)
- Furniture, plastic upholstered
- Furniture, wood or metal with plastic covering and padding

- Glycol in combustible containers (greater than 25 percent and less than 50 percent)
- Linoleum products
- Paints, oil-based in combustible containers
- Pharmaceutical, alcoholic elixirs, tonics, etc.
- Rugs, foam back
- Shingles, asphalt
- Thread or yarn, synthetic or non-viscose

i.e. **High-hazard commodities** are high-hazard products presenting special fire hazards beyond those of class I, II, III or IV. Group "A" plastics not otherwise classified are included in this class. Examples of high-hazard commodities include, but are not limited to, the following:

- Alcoholic beverages, with more than 80-percent alcohol, in bottles or cartons
- Commodities of any class in plastic containers in carousel storage
- Flammable solids (except solid combustible metals)
- Glycol in combustible containers (50 percent or greater)
- Lacquers, which dry by solvent evaporation, in metal cans or cartons
- Lubricating or hydraulic fluid in plastic containers
- Mattresses, foam rubber or foam plastics
- Pallets and flats which are idle combustible
- Paper, asphalt, rolled, horizontal storage
- Paper, asphalt, rolled, vertical storage
- Paper and pulp, rolled, in vertical storage which is unbanded or not protected with an approved wrap
- Pillows, foam rubber and foam plastics
- Pyroxylin
- Rubber tires
- Vegetable oil and butter in plastic containers

ii. Hazard Classification

Hazard shall be classified according to the combustibility of the contents, giving primary consideration to the intensity of fire that could occur; the form in which the products are stored; method of storage; rate of heat release; and period of active burning, to wit:

ii.a. Low Hazard Materials

Items unpacked except as noted

Appliances, electrical

Cables and wiring on reels
Fertilizers, bagged (excluding ammonium nitrate)
Hides, leather
Inert materials, bagged
Metals on wood pallets
Sugar, bagged, raw
Tobacco in hogsheads
Wallboard, gypsum
Wool, baled

ii.b. Average Hazard Materials

ii.b.1. Stocks in Cartons

Books
Ceramics
Cereal
Fiberboard, vegetable
Foods, frozen
Glass
Glycols, in cans
Hydraulic fluids, in cans
Insulators, non-combustible
Liquids, noncombustible, in bottles
Lubricants, in cans
Metals
Paints, oil-based, in cans
Pharmaceuticals, alcoholic elixir, tonics, etc., less than 80 proof
Plastics, low hazard
Stationery
Textiles
Tobacco products
Wiring, electric
Yarns

ii.b.2. Other Stock

Cartons flats
Clothing, packaged or in racks
Feed, bagged
Fiberboard, vegetable on pallets
Flour, bagged
Grain, bagged
Mattresses (excluding foamed) rubber and foamed plastics
Paper and pulp, rolled, vertical storage (adequately banded)

Paper and pulp, horizontal storage (without racks)
Pillows (excluding foamed rubber and foamed plastics)
Pulp, bated
Rags, baled
Rugs (no foamed backing)
Shingles, asphalt
Sugar, bagged, refined

ii.c. High Hazard Materials

Flammable liquids posted in cans metals containers
Baked cork or other insulating materials
Upholstered furniture
Linoleum rugs or piles
Alcohol, weighty proof or higher, in barrels, tank or bottles
Paper products in loosed form not baled not banded and stored horizontally
Baled waste paper
Pharmaceutical containing eighty (80) proof alcohol or higher, in glass/plastic bottles.
Other plastic products
Bags and mats with plastic foam or cellular rubber backing

ii.d. Very High Hazard Materials

Paper products such as pulp/waxed paper, asphalt coated paper in loose form or bobbies or rolled, not banded or baled, and stored vertically
Pyroxylin or foam plastic products unpacked or packed in carton.
Rubber goods and foamed rubber products, unpacked or packed in carton
Flammable liquids, such as acetone, alcohol, lighter fluids, varnish, paints, cleaning fluids, and the like, packed in plastic containers or glass bottles
Cork or other insulating materials, NOT BALED
Ammonium nitrate fertilizer

B. On Fire Protection

1. An approved, supervised sprinkler system shall be required in each building or portion thereof used for storage of combustible commodities when the area exceeds two-thirds of the sum of the basic floor area.
2. The design and installation of an approved, supervised sprinkler system shall conform to NFPA 13, "Standard for the Installation of Sprinkler

System."

3. Sprinkler discharge densities (liters/square meters) for combustible commodities not exceeding six hundred forty centimeters (640 cm) in height shall conform to the following table:

Table 16: SPRINKLER DISCHARGE DENSITIES FOR COMBUSTIBLE COMMODITIES NOT EXCEEDING 640 cm IN HEIGHT, BY HAZARD CLASSIFICATION

HAZARD CLASSIFICATION	COMMODITY CLASS		
	I or II	II or III	III or IV
Low	8.2	8.2	10.2
Average	9.4	11.4	13.5
High	14.3	17.1	20.4
Very High			

4. The protection of combustible commodities six hundred forty centimeters (640 cm) and seven hundred sixty centimeters (760 cm) in height will require up to thirty percent (30%) increase in the densities listed in the above table. Commodities piled more than seven hundred sixty centimeters (760 cm) in height will require multi-level sprinkler application.
5. Sprinkler system protecting combustible commodities shall be designed and installed to discharge the required water density within the following prescribed minimum areas, except that areas shall be not less than three hundred seventy square meters (370 m^2) in calculating water flows when densities of less than one thousand one hundred forty-one liters per minute per square meters ($1,141\text{L}/(\text{min}\cdot\text{m}^2)$) are specified.

Table 17: MINIMUM AREAS OF SPRINKLER DISCHARGE FOR COMBUSTIBLE COMMODITIES, BY HAZARD CLASSIFICATION

HAZARD CLASSIFICATION	AREA (m^2)
Low	370
Average	378
High	418
Very High	557

6. The above-listed minimum areas are based on the regulations for roof venting, draft curtains, aisle spacing, size pile and method of storage. Higher densities may be required in buildings that do not conform to these standards.
7. Sprinkler system shall be designed to utilize sprinklers with ordinal temperature classification, except that sprinklers with an intermediate

classification may be used in the design of systems to protect high or very high hazard occupancies.

8. A minimum clearance of one meter (1 m) shall be provided between sprinkler deflectors and top of storage.
9. Draft curtains shall be provided to limit the area of sprinkler operation and to aid the operation of roof vents.
10. Draft Curtains shall be at least two meters (2 m) in depth and shall be of noncombustible materials. In low or average hazard occupancies, draft curtains, shall divide the under roof area into section not to exceed nine hundred twenty nine square meters (929 m^2). In high or very high hazard storage areas, draft curtains shall divide the under roof area into sections not to exceed five hundred fifty seven square meters (557 m^2).
11. Portable fire extinguishers shall be installed in combustible commodities storage.

C. Fire Safety Clearance

A Fire Safety Clearance from City/Municipal Fire Marshal having jurisdiction shall be obtained for the storage of combustible commodities. A floor plan showing the dimension and location of high piled storage area and aisle dimensions between each storage shall be submitted.

SECTION 10.3.4.1.4 MATCHES

Matches shall be stored, handled and protected as follows:

A. On Storage and Handling

1. In wholesale establishments with matches exceeding sixty (60) matchman's gross stored in shipping container, matches shall be arranged in piles not exceeding three meters (3 m) in height nor more than four hundred twenty five cubic meters (425 m^3) in volume with aisles at least one hundred twenty centimeter (120 cm) wide between piles;
2. Where other materials or commodities are stored on the same floor with matches, a portion of the room shall be devoted to match storage exclusively, and a clear space of not less than one hundred fifty centimeters (150 cm) between match storage and such other materials or commodities shall be maintained;
3. Matches shall be stored in a building, trailer, semi trailer, or metal shipping container with a two-hour (2-hr) fire resistance rating;

4. Matches shall not be stored within three meters (3 m) of any elevator shaft opening, open stairway, or other vertical opening;
5. Where shipping container that contain matches are opened, the contents shall be transferred in bins provided with metal-lined covers.
6. Where matches are sold in retail, original sealed packages shall be stored in shelves. When such packages are broken, individual boxes shall be stored in metal or metal-lined bins.

B. On Fire Protection

1. Smoking is prohibited in areas where matches are stored. A "NO SMOKING" sign shall be conspicuously posted in designated areas.
2. The owner shall be responsible for the prompt removal of any hazardous condition, accumulations of combustible materials, including proper maintenance of equipment and safety devices.
3. Approved, supervised sprinkler system and portable fire extinguishers shall be provided throughout storage and manufacturing areas.

C. Fire Safety Clearance

A Fire Safety Clearance from City/Municipal Fire Marshal having jurisdiction shall be obtained for the storage and transportation of matches exceeding in aggregate twenty (20) matchman's gross (14,000 matches' per matchman's gross).

SECTION 10.3.4.1.5 MAGNESIUM

Magnesium shall be stored, handled and protected as follows:

A. On Storage

1. Magnesium ingots, pigs, and billets shall be carefully piled on firm and generally level areas. Any combustible material shall not be stored within a distance of seven hundred sixty centimeters (760 cm) from any pile of magnesium pigs, ingots, and billets;
2. Outdoor storage of magnesium pigs, ingots and billets shall be in piles not exceeding forty five thousand four hundred kilograms (45,400 kg) each, separated by aisles with width not less than one-half (1/2) the height of the pile;
3. Storage of pigs, ingots and billets in buildings shall be on floors of non-combustible construction. Floors shall be well drained from water. Each pile shall not be larger than twenty three thousand kilograms (23,000 kg), and shall be separated by aisles with width not less than one-half

(1/2) the height of the pile;

4. All magnesium castings shall be clean and free of chips or fine particles of magnesium. The size of storage piles of heavy magnesium castings, either in cartons or crates or free of any packing material shall be limited to thirty six cubic meters (36 m^3). Aisle width shall be at least one-half the height of the piles and shall be at least three meters (3 m).
5. Piles of stored light magnesium castings, either in cartons or crates or without packing, shall be limited in size to twenty eight cubic meters (28 m^3).
6. Aisle spaces in front of racks shall be equal to the height of the racks. All aisle spaces shall be kept clear.
7. Combustible rubbish, spare crates, and separators shall not be permitted to accumulate within the aisles between racks.
8. Wet magnesium scrap (chips, fines, swarf, or sludge) shall be kept under water in covered and vented steel containers at an outside location. Sources of ignition shall be kept away from the drum vent and top. Containers shall not be stacked.
9. Storage of dry scrap in quantities greater than one and four tenths cubic meters (1.4 m^3) shall be kept separated from other occupancies by fire-resistive construction without window openings or by an open space of at least fifteen meters (15 m). Such buildings shall be well-ventilated.
10. Magnesium powder shall be stored in steel drums or other closed conductive containers. The containers shall be tightly sealed and stored in a dry location.
11. Magnesium storage in quantities greater than one and four tenths cubic meters (1.4 m^3) shall be separated from storage of other materials that are either combustible or in combustible containers by aisles with a minimum width equal to the height of the piles of magnesium products.
12. Magnesium products stored in quantities greater than twenty eight cubic meters (28 m^3) shall be separated into piles each not larger than twenty eight cubic meters (28 m^3), with the minimum aisle width equal to the height of the piles but in no case shall be less than three meters (3 m).
13. Where storage in quantity greater than twenty eight cubic meters (28 m^3) is in a building of combustible construction, or the magnesium is packed in combustible crates or cartons, or there is combustible

storage within nine meters (9 m) of the magnesium, the storage area shall be protected by an automatic fire fighting equipment.

14. The size of storage piles of magnesium articles in foundries and processing plants shall not exceed twenty five cubic meters (25 m^3) and shall be separated by aisles of not less than one-half (1/2) the height of the pile.
15. Storage in quantity exceeding one and four-tenths cubic meters (1.4 m^3) of fine magnesium scrap shall be separated from other occupancies by fire-resistive construction without window openings or by an open space of at least one thousand five hundred fifty centimeters (1,550 cm).
16. Storage in quantity greater than twenty eight cubic meters (28 m^3) of shall be separated from all buildings other than those used for magnesium scrap recovery operations by a distance of not less than thirty meters (30 m).

B. On Handling and Processing

1. Magnesium powder production plants shall be located on a site large enough, and shall be located at least nine thousand one hundred fifty centimeters (9,150 cm) away from public roads and from any occupied structure, such as public buildings, dwellings, and business or manufacturing establishments, other than those buildings that are a part of the magnesium powder production plant;
2. Different production operations shall be located in separate but not adjoining buildings that are located at least fifteen meters (15 m) from each other;
3. All buildings used for the manufacture, packing, or loading for shipment of magnesium powders shall be single storey, without basements, constructed of non-combustible materials throughout;
4. Connecting ducts shall be completely without bends. ducts shall be fabricated and assembled with a smooth interior, with internal lap joints pointing in the direction of airflow and without unused capped side outlets, pockets or other dead-end spaces;
5. At each operation, dust shall be collected by means of suitable hoods or an enclosure which is also connected to a blower located outdoors. storage bins for powders should be sealed and purged with inert gas prior to filling;
6. Each machine shall be equipped with its individual dust separating unit, except that with multi-unit machines, not more than two dust-producing units maybe served by one (1) separator;

7. The entire dust collection system shall be constructed of conductive material and shall be completely bonded and grounded. it shall not be provided with filters or other obstructions;
8. Dry dust collectors shall be located outside, in a safe location, and shall be provided with barriers or other means. the area around the collector shall be posted with the following:

**"CAUTION: THIS DUST COLLECTOR CAN CONTAIN EXPLOSIVE DUST.
KEEP OUTSIDE THE MARKED AREA WHILE EQUIPMENT IS OPERATING."**
9. All machines shall be provided with a pan or tray to catch chips or turnings, where they shall be collected every day. Magnesium fines shall be kept separated from other combustible materials;
10. All electric wiring, fixtures and equipment in the immediate vicinity of and attached to dust-producing machines, including those used in connection with separator equipment shall be of types approved for used in class ii, group e hazardous (see building code) and installed in accordance with the Philippine Electrical Code;
11. The power supply to the dust-producing equipment shall be interlocked with the airflow from the exhaust blower and the liquid level controller of the wet-type dust collector;
12. All equipment shall be securely grounded by permanent ground wires;
13. In powder handling or manufacturing buildings and in the operation of dust-conveying systems, every precaution shall be taken to avoid sparks from static electricity, electrical faults, friction, or impact (e.g., iron or steel articles on stones, on each other, or on concrete);
14. Heat treating ovens -approved means shall be provided for control of magnesium fire in heat treating ovens;
15. Melt rooms shall provide access to facilitate fire control. floors shall be of noncombustible construction and be kept clean and free of moisture and standing water;
16. Operators in melting and casting areas shall wear flame-resistant clothing, high foundry shoes, and face protection. Clothing worn where molten magnesium is present shall have no exposed pockets or cuffs;
17. Systematic cleaning of the entire grinding area, including roof members, pipes, conduits, etc. shall be carried out daily. Periodic inspections on buildings and machinery shall be carried out as frequently as conditions warrant.

C. On Fire Protection

1. Only approved Class D extinguishing agents or those tested and shown to be effective for extinguishing magnesium fires shall be permitted. A supply of extinguishing agent for manual application shall be kept within easy reach of personnel while they are working with magnesium. The quantity of extinguishing agent shall be sufficient to contain anticipated fires.
2. Dry sodium chloride, or other dry chemicals or compounds suitable for extinguishment or containment of magnesium fires, shall be permitted to be substituted for Class D fire extinguishers. All extinguishing materials shall be approved for use on magnesium fires.
3. Approved fire-extinguishing materials shall be provided for every operator performing machining, grinding or other processing operation on magnesium as follows:
 - a. Within nine hundred fourteen centimeters (914 cm), a supply of bulk dry extinguishing agents in an approved container with a hand scoop or shovel for applying the material; or
 - b. Within two thousand two hundred eighty six centimeters (2,286 cm), an approved Class D portable fire extinguisher. Pressurized extinguishing agents shall be applied carefully on magnesium powder or chip fire, so as not to disturb or spread the magnesium powder.
4. Application of wet extinguishing agents accelerates a magnesium fire and could result in an explosion. The following agents should not be used as extinguishing agents on a magnesium fire because of adverse reaction:
 - a. Water
 - b. Gaseous-based foams
 - c. Halon
 - d. Carbon dioxide
 - e. Sand and other high Silicon Dioxide (SiO_2)-containing materials

D. Fire Safety Clearance

A Fire Safety Clearance from City/Municipal Fire Marshal having jurisdiction shall be obtained for the storage and transportation magnesium.

SECTION 10.3.4.2 LIQUID

An empirical measure that combines volatility with the heat-producing capabilities of the vapor is the flash point determination. The flashpoint is simply the temperature at which a liquid takes off vapor that can be ignited under specified laboratory conditions. Flash point determinations give rise to hazard classification systems, the most severe hazard being afforded by those liquids with the lowest flash point. Hazardous liquid can be flammable or combustible, depending on the flash point.

SECTION 10.3.4.2.1 FLAMMABLE AND COMBUSTIBLE LIQUIDS

All flammable and combustible liquids shall be stored, handled, transported, used and manufactured as follows:

A. On Storage and Handling

1. General Requirements

Flammable and combustible liquid shall be stored on approved containers or tanks properly labeled with the physical properties of its content, flammability or combustibility and precautionary measures.

2. Specific Requirements for Portable Storage

In the storage and dispensing of flammable and combustible liquids in safety cans, drums or other approved containers not exceeding two hundred twenty seven liters (227l) in individual capacity, and those portable tanks not exceeding two thousand four hundred ninety eight liters (2,498l) in individual capacity, on different types of occupancies, the following requirements shall be complied:

- a. Flammable or combustible liquids specified above shall not be stored near exits stairways or areas normally used as means of egress and ingress. It shall be stored either in storage cabinets or inside storage rooms.
- b. The storage of flammable and combustible liquids in closed containers shall comply with the following occupancy schedule:
 - i. Residential occupancies with not more than three (3) dwelling units with detached garages shall store flammable and combustible liquids up to a maximum of ninety four liters (94 l).
 - ii. Assembly, business and residential occupancies with more than three (3) dwelling units shall store Class I and Class II flammable and combustible combined liquids up to a maximum of thirty eight liters (38 l) or two hundred twenty seven liters (227 l) of Class IIIA liquids.

- iii. Educational, healthcare, and detention and correctional occupancies shall store flammable and combustible liquids up to a maximum of four liters (4l).
- iv. Mercantile and industrial occupancies, where rooms or areas are accessible to the public, storage shall be limited to quantities needed for display and normal merchandising purposes which shall not exceed eighty one liters (81l) per square meter of gross floor area.
- c. In rooms or areas not accessible to the public, storage shall be limited to two hundred twenty seven liters (227l) of Class IA, four hundred fifty four liters (454 l) of Class IB, six hundred eighty one liters (681 l) of Class 1C, nine hundred eight liters (908 l) of Class II, one thousand eight hundred ninety three liters (1,893 l) of combustible liquids or any combination of flammable liquids totaling nine hundred eight liters (908 l).
- d. Containers less than one hundred thirteen liters (113 l) capacity shall not be stacked more than one meter (1 m) or two containers high, whichever is greater, unless on fixed shelving or otherwise satisfactorily secured. Containers more than one hundred thirteen liters (113 l) shall not be stacked one upon the other. All containers shall be stored in an upright position.
- e. Shelving shall be in a stable construction, of sufficient depth and such arrangement that containers displayed thereon shall not be easily displaced.
- f. Leaking containers shall be secured immediately from any possible source of ignition and the contents of which shall be transferred to an approved container and placed to a safe location not accessible to the public. The spill shall be appropriately contained and collected for proper waste disposal.
- g. Dispensing of Class II or III liquids from a single container having a capacity of more than two hundred twenty seven liters (227 l) may be permitted outside of storage and handling room using dispensing device and fire control measures. Both the dispensing container and any reserve containers shall be considered as contributing to the totals allowed capacity under para "A" (2) (e) above.
- h. No pile shall be closer than one meter (1 m) to the nearest beam, chord, girder or other obstruction, and shall be one meter (1 m) below sprinkler deflectors, or discharge orifices of water spray, or other overhead fire protection systems or other obstructions.

Table 18: INDOOR PORTABLE CONTAINER STORAGE FOR FLAMMABLE LIQUIDS

CLASS LEVEL LIQUID	STORAGE LEVEL	LITERS	
		PROTECTED STORAGE MAXIMUM PER PILE	UNPROTECTED STORAGE MAXIMUM PER PILE
IA	Ground & Upper Floors	10,409	2,498
	Basement	NOT PERMITTED	NOT PERMITTED
IB	Ground & Upper Floors	20,818	5,204
	Basement	NOT PERMITTED	NOT PERMITTED
IC	Ground & Upper Floors	62,453	15,613
	Basement	NOT PERMITTED	NOT PERMITTED
II	Ground & Upper Floors	62,453	15,613
	Basement	20,818	NOT PERMITTED
III	Ground & Upper Floors	208,175	52,044
	Basement	31,226	NOT PERMITTED

- i. Solid or palletized pile storage shall be so arranged that piles are separated from each other by at least 1.2m (4ft) wide aisle.
- j. Main aisle shall be provided with a minimum width of 2.4m or of a width providing sufficient space to operate a forklift truck, whenever necessary.
- k. Where the storage of liquid is on racks, a minimum of 1.2m (4 ft) wide aisle shall be provided between adjacent rows of racks and adjacent storage of liquids.
- l. Where ordinary combustible commodities are stored in the same area as liquids in containers, the minimum distance between the two (2) types of storage shall be 2.4m (8 ft) wide aisle.
- m. Storage cabinets may be used where it is desired to keep more than thirty eight liters (38l) of flammable or, combustible liquids inside buildings. Individual container shall not exceed nineteen liters (19l) capacity and not more than one hundred ninety liters (190l) shall be stored in one cabinet.
- n. Storage cabinets shall be approved and shall be substantially constructed to one and two-tenths millimeters (1.2 mm) sheet iron or two and fifty four hundredths centimeters (2.54 cm) plywood or equivalent. A minimum five centimeters (5 cm) sill shall be provided, and cabinet shall be liquid tight to the top of the sill.

Doors shall be equipped with latching device. Cabinets shall be painted with an approved in tumescent type Fire 1 retardant paint. Cabinets shall be conspicuously labeled in red letters "**FLAMMABLE LIQUIDS**".

- o. Storage cabinets shall be located at least eight meters (8 m) away from any source of ignition.
- p. Inside storage and handling rooms shall be constructed to meet the required fire-resistive rating. An approved, supervised sprinkler system shall be installed:
 - i. Opening to other rooms or buildings shall be provided with noncombustible liquid-tight raised sills or ramps at least ten centimeters (10 cm) in height or the floor in the room shall be at least ten centimeters (10 cm) below the surrounding floors. . A permissible alternate to the sill or ramp is an open-grated trench inside the room. A downgraded flooring shall be provided for spillage which drains to a safe location or an open-grated trench.
 - ii. The room shall be provided with approved self-closing fire doors. Where other portions of the building or other properties are exposed, windows shall be of fire rated construction and properly sealed to avoid the spread of vapor. Wood of at least two and fifty four hundredths centimeters (2.54 cm) nominal thickness may be used for shelving rack, Dunnage scuff boards, floor overlay and similar installations.
 - iii. Ventilation shall be designed to provide for a complete change of air within the room at least six (6) times per hour. Ventilation shall be installed in accordance with the provisions of NFPA Pamphlet No. 91, "Blower and Exhaust System." It shall be controlled by a switch located outside the door. The ventilation equipment and any lighting fixtures shall be operated by the same switch. A pilot light shall be installed adjacent to the switch if Class I flammable liquids are dispensed or used within the room.
 - iv. Inside storage and handling rooms shall contain at least one aisle with a minimum width of one meter (1 m). Storage shall not be closer one meter (1 m) to ceiling, or sprinkler heads or other obstructions.
 - v. Stacking of containers shall be in accordance to **Table 18** above.

vi. Inside storage and handling room shall comply with approved, supervised sprinkler system as shown in **Table 19** below:

Table 19: SPRINKLER SYSTEMS FOR INSIDE STORAGE AND HANDLING ROOMS OF FLAMMABLE LIQUIDS

SPRINKLER SYSTEM PROVIDED	FIRE RESISTANCE RATING	MAXIMUM SIZE (Floor Area)	TOTAL LITERS ALLOWED
Yes	2 hours	46.5 sq. m	18, 925
No	2 hours	46.5 sq. m	7, 570
Yes	1 hour	13.9 sq. m	3,785
No	1 hour	13.9 sq. m	1,893

q. **Outside Storage**

- i. Storage of over 100 drums of Class I liquids shall be limited to groups of one hundred (100) drums, located at least eighteen meters (18 m) from the nearest building or line of adjacent property and each group shall be separated by at least twelve meters (12 m).
- ii. Storage of over three hundred (300) drums of Class II or III liquids shall be limited to groups of three hundred (300) drums located at least fifteen meters (15 m) from the nearest building or line of adjoining property and each group shall be separated by at least nine meters (9 m).
- iii. The drum shall be stored in a safe location to prevent runoff or drainage toward other storage or buildings. The area shall be kept clear of grass weeds and other foreign combustibles. Signs shall be posted prohibiting open flames and smoking. Fences or other control measures shall be provided where necessary to protect against tampering or trespassers.
- iv. Storage of flammable or combustible liquids in closed containers in quantities of eighteen thousand nine hundred twenty five liters (18,925 l) or less outside of buildings shall be located with respect to buildings or line of adjoining property as shown in the Table below. These distances may be reduced with respect to warehouses and industrial buildings or noncombustible or fire-resistive construction.

Table 20: STORAGE OF FLAMMABLE OR COMBUSTIBLE LIQUIDS IN CLOSED CONTAINERS OUTSIDE OF BUILDINGS

QUANTITY IN LITERS	DISTANCE FROM BUILDING OR LINE OF ADJOINING PROPERTY WHICH MAY BE BUILT UPON IN METERS
CLASS I	
1 to 568 (3 drums)	4.5
568 to 1892 (3 to 10 drums)	7.5
1893 to 18925 (10 to 100 drums)	15
CLASS II or III	
1 to 568 (3 drums)	1.5
568 to 1892 (3 to 10 drums)	3
1893 to 18925 (10 to 100 drums)	9

- v. In occupancies where the public is invited or allowed to enter, the above distances shall be double.
- vi. Combustible materials shall not be stored or be permitted to accumulate adjacent to flammable or combustible liquid storage outside of buildings in such a manner as to constitute a dangerous exposure to the liquid storage in event of fire. A distance of not less than four and a half meters (4.5 m) shall be maintained between the liquid storage and any combustible materials.
- vii. Storage Limitation of Portable Tanks of flammable and combustible liquids shall be in accordance with the **Table 21** below:

Table 21: OUTDOOR PORTABLE TANK STORAGE

CLASS	MAXIMUM PER PILE (Liter)	DISTANCE BETWEEN PILES (meter)	DISTANCE TO PROPERTY LINES CAN BE BUILT UPON (meter)	DISTANCE TO STREET ALLEY PUBLIC WAY (meter)
IA	8,327	1 .5	6	3
IB	16,654	1 .5	6	3
IC	33,308	1 .5	6	3
II	66,616	1 .5	3	1 .5
Combustible	66,540	1 .5	3	1 .5

NOTES:

- When two or more classes of materials are stored in a single pile, the maximum capacity in that pile shall be the smallest of the two or more separate capacities. The identity of the more

hazardous class and the total amount in the pile cannot exceed that allowed for that class.

- Within sixty meters (60 m) of each group of portable tanks in a pile, there shall be a three and five tenths (3.5) meters wide access way to approach of fire control apparatus.
- The distances listed apply to properties that have protection for exposures as defined. If there are exposures, and such protection for exposure does not exist, the distances in column 4 shall be doubled.
- When total quantity stored does not exceed fifty (50) percent of maximum per pile, the distances in columns 4 and 5 may be reduced 50 percent, but not less than ninety-one centimeters (91 cm).
- The storage of empty portable tanks, and containers, and drums previously used for the storage of flammable or combustible liquids, unless free from explosives vapors, shall be the same as provided for the storage of flammable liquids; provided, however, that the provisions of this Section shall not apply to portable or safety containers cans.
- Tanks and containers when emptied shall immediately be covered, replaced or plugged in the openings.
- Containers of flammable or combustible liquids when piled one upon the other shall be separated to provide stability and to prevent excessive stress on container walls. The height of piles shall be consistent with the stability and strength of containers. In no case shall nominal two hundred liters (200 l) in drums be stored over three times high without approved structural support.

r. **Dispensing**

- i. The dispensing of flammable or combustible liquids is limited to not more than one hundred eight liters (108 l) per container drums at any time and shall be by approved pumps taking suction through the top of the container.
- ii. All mixing, blending, and similar operations involving the use of flammable or combustible liquids shall be performed in an inside storage and handling room of two (2) hours fire-resistive construction.

s. **Fire Protection.** The following are requirements for fire protection in the storage of flammable liquids:

- i. Approved portable fire-aid fire protection appliances;
- ii. Approved, supervised sprinkler system;
- iii. Pre-connected hose line of one and a half inch (1 ½ in) diameter;
- iv. Open flames, smoking and other sources of ignition, shall not be permitted in flammable or combustible liquid storage rooms. A **"NO SMOKING"** sign shall be posted; and
- v. Materials, which react with water or other liquids to produce a hazard, shall not be stored in the same room with flammable or combustible liquids.

3. Specific Requirements for Bulk Plant and Storage

In the storage and dispensing of flammable and combustible liquids in bulk and bulk plant, the following requirements shall be complied:

- a. Class I, Class II and Class III flammable liquids shall be stored in closed containers with a capacity exceeding that of portable tanks. Such tanks may be stored aboveground or underground outside the building.
- b. **For above ground tanks:**
 - i. Tanks shall be installed or rest on the ground and on concrete foundation, masonry, piling or steel. Tank foundation shall be designed to minimize the possibility of uneven settling of the tank and to minimize corrosion in any part of the tank resting on the foundation;
 - ii. Tank support for Class I, Class II or Class III liquids shall be installed on a firm foundation either of masonry or steel;
 - iii. Steel supports or exposed piling shall be protected with materials having a fire resistance rating of not less than two (2) hours; except that when it is supported by steel saddle, it shall not be less than three tenths meter (0.3m) high at the lowest point;
 - iv. Tanks when supported by sphere, special engineering considerations shall be required to prevent excessive concentration of loads on the supporting portion of the shell;
 - v. For tanks located in an area subject to flooding, precautions shall be undertaken to prevent it from floating during rise of water level.

c. For underground tanks:

- i. Underground tank storage for Class I, Class II or Class III liquids shall be covered with a minimum of sixty centimeters (60 cm) earth or shall be covered with not less than thirty centimeters (30 cm) of earth on top of which shall be placed a slab of reinforced concrete not less than ten centimeters (10 cm) in thickness;
- ii. Tanks subjected to traffic shall be protected against damage from vehicles passing over them by at least ninety centimeters (90 cm) of earth cover or fifty centimeters (50 cm) of well tamped earth, and topped with 5 centimeters (5 cm) of concrete or twenty centimeters (20 cm) of asphalted concrete;
- iii. Asphalted or reinforced pavement used as part of the protection of the tank shall be extended at least thirty centimeters (30 cm) horizontally beyond the outline of the tank in all directions;
- iv. Where tank may become buoyant due to rise in the level of water table or due to location in area that may be subjected to flooding, suitable precautions shall be observed to anchor the tank in place.

d. Piping systems:

- i. The design, fabrication, assembly, test, and inspection of piping systems containing flammable and combustible liquids shall be suitable for the expected working pressures and structural stresses in conformity with the internationally accepted standards.
- ii. Joints shall be made liquid-tight and shall be either welded, flanged, or threaded, except that listed flexible connectors shall be permitted to be used where installed.
- iii. Threaded joints shall be made up tight with a suitable thread sealant or lubricant. Joints in piping systems handling Class I liquids shall be welded when located in concealed spaces within buildings.
- iv. Pipe joints, dependent upon the friction characteristics or resiliency of combustible materials for mechanical continuity or liquid-tightness of piping, shall not be used inside buildings. They shall be permitted to be used outside of buildings aboveground or underground. If used aboveground or outside of buildings, the piping shall either be secured to prevent

disengagement at the fitting, or the piping system shall be so designed that any spill resulting therefrom will not expose, cause damage or harm to persons, buildings or structures and could be readily controlled by remote valves.

- v. Pipe systems shall contain a sufficient number of valves to operate it properly and to protect the plant. Pipe systems connected to pumps shall contain a sufficient number of valves to control properly the flow of liquid in normal operation and in event of physical damage. Connection to pipe lines of equipment such as tank cars or tank vehicles discharging flammable or combustible liquids into storage tanks by means of pump, shall be provided with check valves for automatic protection against backflow.

e. **Vents location, arrangement, size and piping:**

- i. Vent pipes from tanks storing flammable or combustible liquids shall be so located that the discharge point is outside of buildings, shall terminate not less than two and forty two hundredths meters (2.42 m) above the fill pipe opening and not less than three and sixty four hundredths meters (3.64 m) above the adjacent ground level. Vent pipes shall discharge only upward or horizontally (not downward) in order to disperse vapors. Vent pipes five centimeters (5 cm) or less in nominal inside diameter shall not be obstructed by devices that will reduce their capacity and thus cause excessive backpressure. Vent pipe outlet shall be so located that flammable vapors will not enter building openings or to be trapped under the eaves of other obstructions. If the vent pipe is less than three meters (3 m) in length or greater than five centimeters (5 cm) in nominal inside diameter, the outlet shall be provided with a vacuum and pressure relief device, or there shall be an approved flame arrester located in the vent line at the outlet. In no case shall a flame arrester be located more than four and five tenths meters (4.5) from the outlet and from the vent line.
- ii. Vent lines from tanks shall not be used for any other purpose.
- iii. Each tank shall be vented through piping adequate in size to prevent blowback of vapor or liquid at the fill opening while tank is being filled. Vent pipes shall not be less than thirty two millimeters (32 mm) in nominal inside diameter.
- iv. Vent pipes shall be so laid as to drain toward the tank without sags or traps in which liquid can collect. They shall be so located that they will not be subjected to physical damages. Vent pipes from tanks storing the same class of liquids may be

connected into one outlet pipe. The outlet pipe shall be at least one pipe size larger than the largest individual vent pipe connected thereto. In no case shall the point of connection between vent lines be lower than the top of any fill pipe opening. The lower end of a vent pipe shall enter the tank through the top and shall not extend into the tank more than two and fifty-four hundredths centimeters (2.54cm).

- f. Fill and discharge lines for Class I, II and III liquids, where practical, shall enter tanks only through the top and shall be graded toward the tank.
- g. The fill-pipe opening shall be located outside of a building. For flammable and combustible liquid storage, the fill-pipe opening shall not be less than one and a half meters (1.5 m) from any door or cellar opening. The fill-pipe for filling by tank car or tank truck shall not be larger than ten centimeters (10 cm) in nominal inside diameter and shall not be constricted. Fill-pipe opening shall be identified by a definite color scheme or other means.
- h. Gauge openings, if independent of fill-pipe, shall be provided with a liquid-tight cap or cover. If inside a building, each opening shall be protected against liquid overflow and possible vapor release by means of a spring loaded check valve or other approved device.
- i. Tanks used for storage of flammable or combustible liquids shall not be installed inside buildings except in industrial establishments, processing plants and service stations.
- j. The storage of flammable and combustible liquids in aboveground tanks outside of buildings shall be restricted within the limits established by law or zoning ordinances.

k. Tank Loading and Unloading Facilities

In the loading and unloading of flammable and combustible liquids, the following requirements shall be complied:

- i. Noncombustible materials shall be used for the construction of loading racks facilities.
- ii. Tank car loading or unloading facilities shall have a distance of at least seven and six tenths (7.6 m) for Class I liquids and at least four and six tenths meter (4.6 m) for Class II and Class III liquids, measured from the nearest fill spout or (liquid or vapor) transfer connection. Buildings for pumps or shelters for personnel may be a part of the facility.

- iii. Equipment such as piping, pumps and meters used for the transfer of Class I liquids between storage tanks and the fill stem of the loading rack shall not be used for the transfer of Class II or Class III liquids.
- iv. Remote pumps located in underground tanks shall be installed on the pump discharge side. A listed and approved leak detection device that will provide an indication if the piping system is not essentially liquid tight shall be installed. This device shall be checked and tested at least annually according to the manufacturer's specifications to insure proper installation and operation.
- v. Loading at the top of a tank vehicle with Class I and Class II liquid without vapor control is allowed if the following is complied:
 - v.i. The valve used for the final control of the flow shall be of the self-closing type and shall be manually held open; and
 - v.ii. Automatic means are provided for shutting off the flow when the tank is full.
- vi. When bottom loading a tank vehicle, with or without vapor control, a positive means shall be provided for loading a predetermined quantity of liquid, together with an automatic secondary shutoff control to prevent overfill. The connecting components between the loading rack and the tank vehicle required to operate the secondary control shall be functionally compatible.
- vii. When bottom loading a tank vehicle that is equipped with vapor control, but when vapor control is not used, the tank shall be vented to the atmosphere to prevent pressurization of the tank. Such venting shall be at a height not lower than the top of the cargo tank on the vehicle.
- viii. When bottom loading a tank vehicle, the coupling between the liquid loading hose or pipe and the truck piping shall be by means of a dry disconnect coupling.
- ix. Connections to the plant vapor control system shall be designed to prevent the escape of vapor to the atmosphere when not connected to a tank vehicle.
- x. Loading racks facilities shall be equipped with protection against static sparks during truck filling. Protection shall consist of a bare metallic bond wire permanently electrically

connected to the fill stem or some part of the fill-stem piping. The free end of such wire shall be provided with a clamp or similar device for convenient attachment to some metallic part of the cargo tank of the tank vehicle. The bond wire connection shall be securely fastened prior to the opening of the dome cover. It shall be maintained in place during the entire filling operation and the dome covers shall be closed before the bond wire is disconnected from the cargo tank.

- xii. Each loading rack facility or property upon which a loading rack facility is located shall be surrounded by a fence not less than one five-tenths (1.5) meters high, constructed of wire mesh, metal sheet or masonry.
- xiii. No person shall load or unload, or allow the loading or unloading of a tank vehicle, unless such vehicle is entirely within such enclosure. No person shall drive or allow the driving of any tank vehicle, into or from the premises of a bulk plant, except while traveling in a forward direction.
- xiv. There shall be installed on each loading rack facility, riser pipe between the ground and the outlet, and at least two valves, one being of the lever-operated type and the other is of the self-closing type, which may be readily operated from the loading rack facility platform or top of the vehicle being filled. It shall be unlawful for any person to tie or unlock such self-closing valve in the open position.
- xv. Class I flammable liquids shall not be dispensed into containers unless:
 - xv.i. The nozzle and container are electrically interconnected;
 - xv.ii. The metallic floor plate on which the container stands while filling is electrically connected to the fill stem; or
 - xv.iii. The fill stem is bonded to the container during filling operations by means of a bond wire.

I. Drainage and Waste Disposal

- i. Flammable or combustible liquids spilled at the loading or unloading areas shall not be directly discharged into the public sewer and drainage system or natural waterways. Grading driveways or intercepting canals with trench grating connected to separator pits and/or other equally effective means shall be constructed.

- ii. Used or accumulated residues of flammable or combustible liquids shall not be dumped on the ground, into sewers, drainage ditches or storm drains, but shall be stored in tanks or tight drums outside of any building until removed from the premises.
- iii. In buildings, rooms or other confined spaces in which flammable or combustible liquids are stored, no combustible waste materials shall be allowed to accumulate.

m. Electrical Equipment

All wirings and electrical equipment located within seven and one half meters (7.5 m) of any portion of the loading rack facility shall be designed, operated and installed in accordance with the latest edition of the Philippine Electrical Code.

n. Testing

All tanks, whether shop-built or field erected, shall be tested. All piping, before being covered, enclosed, or placed in use, shall be hydrostatically tested to 150% of the maximum anticipated pressure of the system, or pneumatically tested to 110% of the maximum anticipated pressure of the system but not less than 5 psi (34.5 kpa) gauge at the highest point of the system. This test shall be maintained for a sufficient time to complete visual inspection of all joints and connections, but for at least 10 minutes. A certificate of testing shall be submitted to the City or Municipal Fire Marshal having jurisdiction.

o. Abandonment of Tanks

- i. Any tank not used for a period of ninety (90) days, shall be properly safeguarded or removed in a manner approved by the City or Municipal Fire Marshal having jurisdiction.
- ii. Tanks "temporarily out of service" shall have fill line, gauge opening and pump connection secured against tampering. Vent lines shall remain open and maintained in accordance with the requirements of this Rule for vent lines.
- iii. Any aboveground tank, which has been abandoned for a period of one (1) year, shall be removed from the property in a manner approved by the City or Municipal Fire Marshal having jurisdiction.
- iv. Any underground tank, which has been abandoned for a period of one (1) year, shall be removed from the ground and the hole properly filled.

v. Tanks which are to be reinstalled for flammable or combustible liquid service shall comply the same requirements in the installation of tanks.

vi. Tanks which are to be placed back in service shall be tested accordingly.

p. **On Fire Protection**

- i. Flammable or combustible liquids shall not be handled, drawn or dispensed where flammable vapors may reach a source of ignition. Smoking shall be prohibited except in designated locations. "**NO SMOKING**" signs shall be posted in conspicuous places where hazard from flammable vapors is normally present.
- ii. Foam fire protection shall be provided for any aboveground tank except floating roof type, or pressure tanks operating at or above seventy and four-tenths grams (70.4 g) per square centimeters gauge pressure, and used for the storage or handling of Class I flammable liquids such that tank or group of tanks are spaced less than fifteen (15) meters apart, shell to shell, has a liquid surface area in excess of one hundred forty square meters (140 m^2).
- iii. Legible signs shall be maintained at the entrance gate or gates of each bulk plant and near each loading rack facility with the words "**NO SMOKING**". Restriction on the use of electronic devices within the premises of bulk plants shall be observed.
- iv. Signs identifying the pump master switch shall be labeled "**EMERGENCY PUMP SHUTOFF**".
- v. The master switch on all individual pump circuits switches shall be set in the "**OFF**" position before closing the services station for business at any time.
- vi. Pressure system shall incorporate with each turbine, an indicator light illuminated when the turbine is running. Said light shall be visible from the dispensing pump island, and suitably identifiable as to the system served.

4. **Service Stations for Automobile**

- a. Service stations shall be constructed with facilities for storage, handling and dispensing of flammable and combustible liquids, including its equipment, appurtenances and service area in either inside or outside buildings.

- b. Service stations or portions thereof where flammable gases such as but not limited to liquefied petroleum gases (LPG), liquefied natural gases (LNG), or compressed natural gases (CNG) shall be governed in a separate rule.
- c. Buildings used for office, grocery store, rest room, utility room and the like shall conform to the succeeding paragraphs hereof.
 - i. The service station location standard for facilities, clearances and distance applicable to all kinds of lots from mid-block lot, corner lot and passing-thru lot shall comply with the standards set forth under Philippine National Standard on "*Petroleum Products-Retail Outlet-Health, Safety and Environment*" - PNS/DOE FS 1-1:2005.
 - ii. Apparatuses dispensing Class I flammable liquids into the fuel tanks of motor vehicles of the public shall not be located at a bulk plant unless separated by a fence or similar barrier from the area in which bulk operations are conducted.
 - iii. Tanks shall be located to minimize the amount of maneuvering necessary for the tank truck making the product delivery to reach the fill openings whenever possible. Deliveries shall be accomplished without the need for the truck to move or travel in reverse.
 - iv. Tanks shall be located so that the tank truck making the product delivery will not be on public right of way, block motorists' views of roadway, or impede the flow of vehicles or pedestrians.
 - v. Tank edge shall not be less than one meter (1 m) from the property line or any other buildings or structures. If soil stability creates concern, qualified professional assistance is recommended.
 - vi. Underground tanks or tanks under buildings shall be so located with respect to existing building foundation and support so that the load carried by the latter cannot be transmitted to the tanks.
 - vii. Dispensing devices at automobile service stations shall be located that all parts of a vehicle being serviced are within the premises of the service station.
 - viii. Dispensing devices at automobile service stations shall be located not less than six (6) meters from any building openings and public ways. Such dispensing devices shall also be so located that the nozzle, when hose is fully extended, shall not

reach within one and a half meters (1.5 m) of any building opening.

- ix. All dispensing devices shall be mounted on a concrete island or shall otherwise be protected against collision damage by an acceptable means. Dispensing device shall be securely bolted in place. Dispensing devices shall be installed in accordance with the manufacturers' instruction. The minimum height of the concrete island shall be not less than fifteen centimeters (15 cm).
- x. Emergency controls shall be installed at a location acceptable to the City/Municipal Fire Marshal having jurisdiction, but controls shall be not more than thirty meters (30 m) from dispensers.

d. On Storage and Handling

- i. Class I liquid shall be stored in closed containers or tanks located underground or in special enclosures.
 - i-a. Special enclosures shall be liquid and vapor tight without backfill. The sides, top and bottom of enclosures shall be of reinforced concrete at least fifteen centimeters (15 cm) in thickness, with openings for inspection through the top.
 - i-b. Tank connection shall be a closed pipe connection or installation. Precautionary measures shall be provided whereby portable equipment may be employed to discharge to the outside any vapors, which might accumulate, should leakage occur.
- ii. Class I liquids shall not be stored or handled within a building having a basement or pit into which flammable vapors may travel unless such area is provided with ventilation designed to prevent the accumulation of flammable vapors therein.
- iii. Aboveground tanks located in an adjoining bulk plant may be connected by piping to service station underground tanks. An emergency shut-off valve shall be provided within the control of service station personnel.
- iv. Flammable and combustible liquids may be stored in an approved container inside service station buildings, provided that the following conditions are observed:
 - iv.a. Class I liquids stored in approved closed containers of aggregate capacity not exceeding four hundred fifty four liters (454 l), provided that a single container

shall not exceed two hundred twenty seven (227 l) liters capacity and equipped with an approved pump; and

iv.b. Class II and III liquids stored in approved containers of not exceeding four hundred fifty five four liters (454 l) capacity for each class, with an aggregate capacity not exceeding nine hundred eight liters (908 l).

v. Piping, valves and fittings shall be in accordance with the provisions of *Specific Requirement for Bulk Plant and Storage*.

vi. Class I liquids *shall* not be dispensed or transferred within a service station building, except:

vi.a. When the dispensing device is connected to any pump motor circuit energized by a switch located on each dispenser and can be operated by removal or displacement of the nozzle in its bracket;

vi.b. A clearly labeled manually operated pump master switch is provided in an approved location, within twenty-two meters (22 m) of, but not nearer than four and six-tenths meters (4.6 m) to any dispensing device. Where such master switch is not visible from all dispensing devices, the location thereof shall be indicated by approved signs;

vi.c. Signs identifying the pump master switch shall be labeled "**EMERGENCY PUMP SHUTOFF**";

vi.d. The master switch on all individual pump circuits switches shall be set in the "**OFF**" position before closing the service station for business; and

vi.e. Pressure system shall incorporate with each turbine, an indicator light illuminated when the turbine is running. Said light shall be visible from the dispensing pump island, and suitably identifiable as to the system served.

vii. Class II and III liquids may be dispensed in lubrication or service station buildings provided that flammable vapors do not reach heating equipments or other sources of ignition. Smoking shall be prohibited except in designated locations. "**NO SMOKING**" signs shall be posted conspicuous areas where hazard from flammable vapors is normally present.

viii. No delivery of any flammable or combustible liquid shall be made into portable containers unless such container is of approved material and construction, having a tight closure with screwed or spring cover, so designed that the contents can be dispensed without spilling. The dispensing of flammable liquids into fuel tanks of vehicles or into a container shall at all times be under the supervision of a qualified attendant, except in service stations not open to the public. Such stations may be used by commercial, industrial, governmental or manufacturing establishments for fueling vehicles used in connection with their activities or operation. However, personnel of such establishments shall have knowledge and skills in dispensing flammable and combustible liquids.

ix. Dispensing Services

- ix.a. Flammable and combustible Class I liquids shall be transferred from underground tanks by means of fixed pumps designed and equipped to allow control of the flow and to prevent leakage or accidental discharge. Supplemental means shall be provided outside of the dispensing device whereby the source of power may be readily disconnected in the event of fire or other related accidents.
- ix.b. Dispensing pumps that take suction at the top of the container shall be of approved type as UL and FM Listed or other equivalent internationally accepted standard.
- ix.c. Any device that operates through pressure within a storage tank or container shall not be allowed, unless the tank or container has been approved as pressure vessels. In no case shall air or oxygen pressure be used for dispensing flammable and combustible liquids.
- x. Pumps pressure delivery on service station shall be installed above grade level outside of buildings and shall be located not less than three meters (3 m) from line of adjoining property of noncombustible materials with at least one (1) hour fire resistance rating or from a property line that abut upon a public right-of-way or thoroughfare.
 - x.a. Pumps installed above grade level shall be mounted on a concrete foundation and shall be protected against possible damage by vehicles.

x.b. Submersible or subsurface pumps shall be installed in accordance with approved standards.

xi. Special dispensing device

xi.a. Approved type are those but not limited to self-service and remote preset types. At least one qualified attendant shall be on duty while the station is open to the public. The attendant's primary function shall be to supervise, observe and control the dispensing of Class I flammable and combustible liquids. It shall be the responsibility of the attendant to see to it that the dispensing of Class I liquids are in approved portable containers.

xi.b. The attendant or supervisor on duty shall be capable of performing the functions and assuming the responsibilities covered as mentioned hereof.

xi.c. Instructions for the operation of dispensers shall be posted in conspicuous places.

xi.d. Remote preset type devices are to be in the "OFF" position while not in use so that dispensers cannot be activated without the knowledge of the attendant.

xii. If the dispensing of Class I liquids at a service station available and open to the public is to be done by a person other than the service station attendant, the nozzle shall be of a listed and approved automatic closing type.

xiii. Every service station open to the public shall have an attendant or supervisor on duty duly qualified and/or trained by the BFP.

xiv. Piping, Valves and Fittings

xiv.a. Piping valves and fittings shall be designed for the working pressure and structural stresses to which they may be subjected. They shall be galvanized or otherwise protected against external corrosion with an approved material. All threaded joints or connections shall be made up tight with the use of an approved pipe joint sealing compound.

xiv.b. A check or manual valve shall be provided in the discharge dispensing supply line from the pump with a union between the valve and the same pump discharge.

xiv.c. An approved impact valve, incorporating a fusible link, designed to close automatically in the event of severe impact or fire exposure shall be properly installed, rigidly mounted, and connected by a union in the dispensing supply line at the base of each dispensing device.

xiv.d. After completion of the installation, the system shall be tested.

xv. All electrical equipment, wiring and wiring devices for service stations shall comply with the latest edition of the Philippine Electrical Code (PEC).

xvi. Classified area shall not extend beyond the un-pierce wall or other solid partition as shown in **Table 22** below:

Table 22: ELECTRICAL EQUIPMENT HAZARDOUS AREA SERVICE STATIONS

LOCATION	NEC CLASS I, GROUP D DIVISION	EXTENT OF CLASSIFIED AREA
Underground Tank-fill Opening	1	Any pit, box or space below grade level, any part of which is within the Division 1 to 2 of classified area
	2	Up to forty six (46) centimeters level within a horizontal radius of three (3) meters from a loosen fill connection and within the horizontal radius of one and a half (1.5) meters from a tight fill connection
Underground Tank- Vent Discharging Upward	1	Within ninety one (91) centimeters of open and off vent, extending in all directions
	2	Area between ninety one (91) centimeters and one and a half (1.5) meters of open and off vent, extending in all directions
Dispenser-Pits	1	Any pit, box or space below grade level, any part of which is within the Division 1 or 2 classified area
Dispenser-Enclosure	1	The area one and two-tenths (1.2) meters vertically above grade within the enclosure of forty six (46) meters in all direction
Dispenser-Outdoor		Up to forty six (46) centimeters above grade level within six (6) meters horizontally of any edge of enclosure

LOCATION	NEC CLASS I, GROUP D DIVISION	EXTENT OF CLASSIFIED AREA
Dispenser-Indoor with Mechanical Ventilation	2	Up to forty six (46) centimeters above grade or floor level within seven and six-tenths (7.6) meters horizontally of any edge of enclosure
Remote Pump Outdoor	1	Any pit, box or space below grade level if any part is within a horizontal distant of three (3) meters from any edge of pump
Remote Pump Indoor	2	Within ninety one (91) centimeters of any edge of pump, extending in all directions. Also up to forty six (46) centimeters above grade level within three (3) meters horizontally from any edge of pump
Lubrication Room	1	Entire area within any pit
Lubrication Room Dispenser for Class I Liquids	2	Within one and a half (1.5) meters of any edge of pump, extending, in all directions. Also up to ninety one (91) centimeters above floor or grade level within seven and six-tenths (7.6) meters horizontally from any edge of pump.
Special Enclosure Inside Building per Sec.23.703 (b)	1	Area up to forty six (46) centimeters above floor or grade level within entire lubrication room
Sales Storage and Rest Rooms	Ordinary	Within ninety one (91)centimeters, of any fill or dispensing point, extending in all directions
		Entire enclosure
		If there is any opening of these rooms within the extent of an outdoor classified area, the entire room shall be the same as the area classification at the point of the opening. If there is any opening of these rooms within the extent of an indoor classified area, the room shall be classified the same as if the wall, curb or partition did not exist.

xvii. Drainage and waste disposal

xvii.a. Flammable or combustible liquids spilled within the premises of service stations shall not be directly

discharged into the public sewer and drainage system or natural waterways. Precautionary measures to contain such spill shall be adopted but not limited to grading driveways or intercepting canals with trench grating for containment leading to a catch basin with a capacity that can accommodate the contents of the largest compartment of the tank vehicle being dispensed.

- xvii.b. Used or accumulated residues of flammable or combustible liquids from separator pits and/or other equally effective means shall not be dumped on the ground, into sewers, drainage ditches or storm drains, but shall be stored in tanks or tight drums outside of any building until removed from the premises.
- xvii.c. Pits intended to contain subsurface pumps or fittings from submersible pumps shall not be longer than necessary to contain the intended equipment and to permit the free movement of hand tools operated from above grade.
- xvii.d. Pits and covers shall be designed and constructed to withstand the external forces to which they may be subjected. When located above any underground tank, at least thirty centimeters (30 cm) of earth or sand cover shall be maintained over the top of the tank.
- xvii.e. Pits shall be protected against ignition of vapors by any of the following methods:
 - Sealing the un-pierced cover with mastic or by bolting against a gasket in an approved manner.
 - Filling the pit with a noncombustible inert material.

5. Service stations inside buildings

- a. Service stations inside buildings shall be separated from other portions of the building by wall, partition, floor, or floor-ceiling assemblies having a fire resistance rating of not less than two (2) hours.
- b. The dispensing area shall be located at street level, with no dispensing device located more than fifteen meters (15 m) from which vehicles exit to, or entrance from, the outside of the building. Such area shall also be provided with an approved mechanical or gravity ventilation system. Ventilating systems shall be electrically interlocked with Class I dispensing devices so that the same cannot

be operated unless the ventilating fan motors are energized.

- c. Dispensing shall be limited to the area required to serve not more than four (4) vehicles at a time;
- d. Where an outside location is impractical, dispensing devices may be approved inside garages or similar establishments that store, park, service or repair automotive equipment, provided that the following requirements are complied:
 - i. The dispensing device shall be located in a well ventilated area of fire-resistive construction, and shall not be less than six meters (6 m) from any activity involving sources of ignition;
 - ii. It shall be protected against physical damage from vehicles by mounting impact barriers on a concrete island or by equivalent means, and shall be located in a position where it cannot be stuck by vehicle descending a ramp or other slope out of control; and
 - iii. A remote emergency shutoff electric power to the dispensing unit and the pump supplying it shall be provided at an accessible location and shall be clearly labeled as to its intended purpose.

e. **Fire Protection**

- i. A minimum classification of Class 5-B, C fire extinguishers shall be provided and so located that no pump, dispenser or fill-pipe opening shall be of a greater distance than nine and fifteen tenths meters (9.15 M) from such extinguishers and shall be readily accessible where fires are likely to occur.
- ii. Placement and size of fire extinguishers shall be in accordance with **Table 23** below.

Table 23: FIRE EXTINGUISHER SIZE AND PLACEMENT FOR CLASS B HAZARDS

Type of Hazard	Basic Minimum Extinguisher Rating	Maximum Travel Distance to Extinguishers (m)
Light (low)	5-B	9.15
	10-B	15.25
Ordinary (moderate)	10-B	9.15
	20-B	15.25
Extra (high)	40-B	9.15
	80-B	15.25

iii. Existing service stations with dispensing areas located below street level may be permitted, provided that an approved automatic sprinkler system is installed and the provision of paragraph e sub-para i above shall be complied.

f. **Safety Precaution**

- i. The engine of all vehicles being fueled shall be shut-off during fueling or re-fueling.
- ii. Smoking, use of electronic devices and open flames are strictly prohibited in areas where flammable or combustible liquids are dispensed.
- iii. Signs of the above prohibitions shall be posted within the premises of the service station. A warning sign shall be conspicuously posted in the dispensing area indicating that it is unlawful and dangerous to dispense gasoline into unapproved containers.
- iv. All vendors using open flames are also prohibited within the premises.
- v. Necessary repairs of the service station involving hotworks shall comply with the applicable provisions of Division 17 of this IRR.

6. **Marine Service Stations**

- a. Marine service stations shall not be located at bulk plants unless separated by a fence or similar barriers from the area in which bulk operations are conducted.
- b. Piers, wharves and floats where flammable or combustible liquid dispensers are located shall be of fire-resistive construction and impervious to spills of such liquids and oils within the immediate area of the dispenser.
- c. Flammable and combustible liquids may be stored in approved portable containers within marine service station buildings. Storage of Class I liquids in approved closed portable containers shall not exceed thirty-eight liters (38 ℥) aggregate capacity except within rooms or buildings approved for such storage or which meet the requirements of ventilation.
- d. Class II or III liquids may be stored and dispensed inside marine service station buildings from approved containers of not more than four hundred fifty five liters (455 ℥) capacity, provided that;

- i. Tanks, valves, fittings and piping for flammable or combustible liquids and liquefied petroleum gases are approved for such use and fully protected from external-corrosion.
- ii. There shall be no connection between any aboveground tank and any underground tank except that aboveground tanks located in an adjoining bulk plant may be connected by piping to marine service station underground tanks if, in addition to valves at the above ground tanks, a valve is also installed within control of marine service station.
- iii. Pipelines of marine service stations attached to piers, wharves or other structures shall be fully protected against physical damage and excessive stresses.
- iv. A valve capable of shutting off supply from the shore shall be provided in each product line at or near the approach of the pier, wharf or other structure and an approved quick throw valve shall be provided above each flexible connection to stop flow to float in the event of rupture or such flexible connections.
- v. Not more than two flexible connections shall be permitted in any line leading from any pier or wharf to a float. When unusual conditions exist, additional flexible connections may be allowed subject to the approval of the City/Municipal Fire Marshal having jurisdiction.
- vi. All commodity piping at marine service stations shall be welded or welded flanged of steel construction. Screwed piping of five centimeters (5 cm) or less in diameter shall be permitted.
- vii. Piping systems used in handling Class I liquids shall be grounded to control stray electrical current.
- viii. Testing of piping systems shall be in accordance with applicable provisions of this IRR on testing.

- e. Wharves, piers, or floats at marine service stations shall be used exclusively for the dispensing or transfer of petroleum products to or from marine craft, except that transfer of essential supplies for ship stores is permitted. Sales of ship stores or merchandise shall not be allowed in an area where fuel is dispensed into the tank of motor crafts.
 - i. Tanks and pumps, other than those integral with approved dispensing devices that supply flammable or combustible liquids at marine service stations, shall be located only on shore. Approved dispensing devices with or without integral pumps may be located on shore piers of solid fill type, open pier,

wharves of floating docks, but only upon express permission of the City/Municipal Fire Marshal having jurisdiction.

- ii. Dispensing of flammable or combustible liquids and liquefied petroleum gases shall at all times be under the direct control of competent person who is fully aware of the operation, mechanics, and hazards inherent to fueling of boats.
- iii. Dispensing of flammable or combustible liquids into the fuel tanks of marine crafts shall be by means of an approved type hose, equipped with a listed automatic closing nozzle with latch open device.
- iv. Hoses used for dispensing or transferring flammable or combustible liquids shall be reeled, racked or otherwise protected from mechanical damage when not in use.
- v. Fueling of floating marine crafts other than from a marine service station is prohibited.
- vi. No delivery of any flammable or combustible liquids shall be made into portable containers unless such containers is of approved material and construction, having a tight closure with screwed or spring cover, so designed that the contents can be dispensed without spilling.
- vii. Liquefied petroleum gas cylinders shall not be filled or discharged at any petroleum marine service station without first obtaining written permission from the City/Municipal Fire Marshal having jurisdiction. Approved storage facilities for liquefied petroleum gas cylinders shall be provided.
- viii. The dispensing area shall be located away from other structures to provide room for safe ingress and egress of crafts to be fueled. Dispensing units shall, in all cases, be at least six meters (6 m) from any activity involving fixed sources of ignition.

f. Fire Prevention Regulations

- i. All marine facilities shall be maintained in a neat and orderly manner and no accumulation of rubbish or waste oils in excessive amounts shall be permitted. Any spills of flammable or combustible liquids at or upon the water of marine service stations shall be reported immediately to the BFP and port authorities.
- ii. Metal containers with tight-fitting or self-closing metal lids shall be provided for the temporary storage of combustible trash or rubbish.

- iii. No vessel or craft shall be allowed to moor or berth at any fuel docks serving a marine services station, except during fueling operations.
- iv. No construction, maintenance, repair or reconditioning work involving the use of open flames or arcs or spark-producing devices shall be performed at any marine service station facility or within fifteen meters (15 m) of the dispensing facilities including piers, wharves, or floats. The City/Municipal Fire Marshal having jurisdiction may grant permission in writing to make repair provided no fueling is done at the pier, wharf, or float during the course of such emergency repairs.
- v. All electrical equipment must comply with the latest edition of the Philippine Electrical Code as it applies to wet, damp and hazardous location. Clearly identified emergency switches readily accessible in case of fire at any dispensing unit shall be provided on each main float and at the shore approach to the pier, wharf or floating dock, to shut off power to all pump motors from any individual location and reset only from the master switch. Each switch shall be identified by an approved sign: "**EMERGENCY PUMP SHUTOFF**". The master switch shall be set in the "**OFF**" position before closing a marine service station. Pressure system shall incorporate with each turbine an indicator light illuminated when the turbine is running. Said lights shall be visible from the shore approach and from the dispenser location and suitably identify the system served.
- vi. Smoking or open flames shall be prohibited within fifteen meters (15 m) of fueling operations. "**NO SMOKING**" signs shall be posted conspicuously within the premises. Such signs shall have letters not less than centimeters (10 cm) in height on a background of contrasting color.
- vii. Boat owners or operators shall not offer their craft for fueling unless the tanks being filled are properly vented to dissipate fumes to the outside atmosphere.
- viii. There shall be prominently displayed at the face of each wharf, pier or float at such elevation as to be clearly visible from the decks of marine craft being fueled, a sign or signs with letters not less than eight centimeters (8 cm) in height in a background of contrasting color bearing the following or equivalent wording:

WARNING
NO SMOKING - STOP ENGINE WHILE FUELING.
SHUT OFF ELECTRICITY. DO NOT START ENGINE UNTIL AFTER
BELLOW-DECK SPACES ARE VENTILATED

g. Fire Protection

- i. Appropriate communication means shall be available for calling the Fire Department. Such means may consist of a proprietary alarm system, a firefighters' alarm box or telephone not requiring a coin to operate. It must be within meters (30 m) of the premises of a marine service station.
- ii. Piers, wharves and floats at marine service stations shall be equipped with wet standpipes connected to a reliable water supply with piping not less than five centimeters (5 cm) in diameter.
- iii. Pipe fittings and joints shall be adequately treated to protect metal from corrosion. A flexible connection may be permitted between the dock or pier and any floating deck.
- iv. Hose stations shall be equipped with a thirty-eight millimeter (38 mm) valve, at least twenty-two meters (22 m) of approved fire hose, and a combination fog and straight streams shutoff type nozzle. Hose stations shall be so spaced as to provide protection to any portion of docks, piers, wharves or floating crafts. Hose shall be enclosed within a cabinet connected and mounted on a reel or rack for instant use. Hose stations shall be labeled "**FIRE HOSE-EMERGENCY USE ONLY**". All tests and valves must meet the approval of the City/Municipal Fire Marshal having jurisdiction.
- v. Fire extinguishers each having a rating of 20-B, C shall be provided as follows: One (1) on each float and one (1) on the pier or wharf within seven and a half meters (7.5 m) of the head of the gangway to the float, except that where the office is within seven and a half meters (7.5 m) of the gangway or is on the float, an extinguisher at the head of the gangway need not be provided.

7. Processing Plants

a. On storage and handling

The manner of storage, handling, dispensing and fire protection of flammable or combustible liquids in Processing Plants shall comply with the requirements and standards set forth under bulk and bulk plants storage, and the requirements and standards on portable storage. In addition, the following requirements shall also be complied:

- i. Mixing or blending rooms or buildings shall meet the design requirements set forth under the rule on "*Design and Construction of Inside Storage and Handling Rooms.*"
- ii. Vessels used for mixing or blending of Class I flammable liquids shall be provided with self-closing, tight-fitting noncombustible lids that will control fire within such vessels. Where such devices are impracticable, approved automatic or manually controlled fire-extinguishing systems/devices shall be provided.
- iii. All equipment, such as vessels, machinery, and piping, where an ignitable mixture could be present shall be bonded or connected to a ground. The bond or ground or both shall be physically applied or shall be inherently present by the nature of the installation. Electrically isolated sections of metallic piping or equipment shall be bonded to the other portions of the system or individually grounded to prevent the hazardous accumulation of static electricity.

8. Refineries, Chemical Plants and Distilleries

a. On Storage and Handling

The manner of storage, handling, dispensing and fire protection of flammable or combustible liquids in Refineries, Chemical Plants and Distilleries shall comply the requirements and standards for bulk and bulk plants storage, requirements and standards on portable storage. In addition, the following requirements shall also be complied:

- i. Processing units shall be located to at least one side to make it accessible for the purpose of fire control. Where topographical conditions are such that flammable or combustible liquids may flow from a processing area to constitute a fire hazard to other properties, provisions shall be made to divert or impound the flow by curbs, drains or other suitable means.
- ii. Water shall be available in pressure and quantity sufficient to provide cooling streams for any unit of any tank in the processing area. Hoses and hydrants shall be available in sufficient number to provide application for cooling streams.

9. Crude Oil Production

a. On Storage and Handling

The manner of storage and fire protection of flammable or combustible liquids in crude oil production shall comply the standards and requirements for bulk and bulk plants storage and

standards and requirements for portable storage. In addition, the following requirements shall also be complied:

- i. Oil wells shall have a minimum distance of fifty meters (50 m) from a surface property line.
- ii. No oil well shall be drilled within fifty meters (50 m) or one and one half (1-1/2) times the height of the derrick, whichever is greater from any road or highway or major aboveground utility line or railroad.
- iii. No oil well shall be drilled nor production equipment and storage tank installed within less than the following setbacks:
 - iii.a. One hundred sixteen meters (116 m) from an existing occupied building and/or habitable dwelling
 - iii.b. One hundred sixteen meters (116 m) from educational facility, public places assembly and institutional occupancy
- iv. No boiler, fired vessel, heater-breather, open flame device or other potential sources of ignition shall be located nearer than fifty meters (50 m) to any oil well or storage tank. Vehicles and equipment used in the drilling and well servicing operations are exempt from the above provision.
- v. No sump or other basin for the retention of oil or petroleum products shall exceed three hundred seventy centimeters (370 cm) in width.
- vi. No sump or other basin for the retention of oil or petroleum products, larger than one hundred eighty centimeters (180 cm) deep shall be maintained longer than sixty (60) days after the cessation of drilling operations.
- vii. Sumps, diversion ditches or depressions used as sumps shall be securely fenced or covered.
- viii. Adequate blowout prevention equipment shall be used on all well servicing operations. Blowout prevention equipment shall contain pipe rams that enable closure on the pipe being used. The choke line and kill lines shall be anchored, tied or otherwise secured to prevent whipping resulting from pressure surges.
- ix. Blowout prevention equipment shall be inspected daily and a preventer operating test shall be performed on each round trip, but not more than once every twenty-four (24) hours. Notation of operating tests shall be made on the daily report.

- x. Drilling operations shall not proceed until blowout prevention equipment are tested and found to be serviceable.
- xi. Berms shall be constructed around crude oil and condensate storage tanks in the absence of remote impounding. It shall enclose an area sufficient to contain at least one hundred fifty percent (150%) of the largest single tank.
- xii. Not more than two (2) crude oil and condensate storage tanks shall be located within a single berm.
- xiii. Berms shall be inspected at regular intervals to maintain containment integrity.
- xiv. Where soundproofing material is required during oil field operations, such materials shall be non-combustible. A fire-retardant treated material may be used and maintained subject to the approval of the City/Municipal Fire Marshal having jurisdiction.

10. Tank Vehicles for Flammable and Combustible Liquids

The manner of storage, handling, operation and fire protection in tank vehicle for flammable or combustible liquids shall comply the following requirements:

a. On Storage, Handling and Operation

- i. Design and Construction of Tank Vehicle
 - i.a. Tank vehicles shall be designed, constructed, equipped and maintained in accordance with NFPA 385, "*Standard for Tank Vehicles for Flammable and Combustible Liquid*." Design of the tank vehicle shall consider the structural relationship between the cargo tank, propulsion equipment, and the supporting members with due regard to the weight and temperature of the cargo, road performance, braking and required ruggedness. The general design of the cargo tank and vehicle chassis shall be arranged to give the best combination of structural characteristics and vehicle performance.
 - i.b. The material used in the construction of cargo tanks shall be compatible with the chemical characteristics of the flammable and combustible liquids to be transported.
 - i.c. If a single cargo tank is divided into compartments of different specification construction, each compartment

shall conform to the specification requirements and shall be identified with a permanent non-corrosive metal plate.

- i.d. Any cargo tank designed for transporting materials at liquid temperatures above ambient temperatures shall have a non-corrosive metal warning plate permanently affixed to the tank or tank frame located conspicuously at the right side near the front specifying the maximum allowable cargo temperature. Stamped or embossed characters shall be at least thirteen millimeters (13 mm) in height.

- ii. Full Trailers and Semi-Trailers

- ii.a. Trailers shall be firmly and securely attached to the vehicle drawing them, in a manner conforming to accepted engineering practice.
- ii.b. Each full trailer and semi-trailer shall be equipped with reliable brakes on all wheels, and adequate provision shall be made for their efficient operation from the driver's seat of the vehicle drawing the trailer or semi-trailer.
- ii.c. Trailer connections shall be such as to prevent the towed vehicle from whipping or swerving from side to side dangerously or unreasonably, and shall cause the trailer to follow substantially in the path of the towing vehicle.

- iii. Operation of Tank Vehicles

- iii.a. Tank vehicles shall not be operated unless they are in proper state of serviceability, devoid of accumulation of grease, oil or other flammable and from leaks.
- iii.b. Drivers shall be thoroughly trained in the operation of tank vehicles and proper procedures for loading and unloading.
- iii.c. Dome covers shall be closed and latched while the tank vehicle is in transit.
- iii.d. No tank vehicle shall be operated with a cargo temperature above the maximum allowable cargo temperature specified on the warning sign.
- iii.e. Flammable and combustible liquids shall be loaded only into cargo tanks whose material used in construction shall be compatible with the chemical characteristics of the liquid being loaded. The flammable and combustible

liquid being loaded shall also be chemically compatible with the liquid hauled on the previous load unless the cargo tank compartment, piping, pumps, meters and hose has been thoroughly cleaned and completely drained.

iii.f. Class II or Class III liquids shall not be loaded into a compartment adjacent to Class I liquids unless double bulkheads are provided, nor shall chemically non-compatible chemicals be loaded into adjacent compartments unless separated by double bulkheads.

iii.g. Repair of tank vehicles shall be made with caution. No repair shall be made when there is presence of hazard due to combustible vapors nor any loaded tank vehicle be repaired in a closed garage.

iii.h. Cargo tank shall not be repaired using any method employing a flame, arc, or other sources of ignition, unless the tank is maintained vapor-free or otherwise made safe in an approved manner.

iv. Loading and unloading tank vehicles

iv.a. Loading and unloading of tank vehicles shall only be done in approved locations prescribed by the concerned agency.

iv.b. Flammable or combustible liquid shall not be transferred to or from any tank vehicles, unless the parking brake is securely set and all other reasonable precautions have been taken to prevent motion of the vehicle.

iv.c. The driver, operator or attendant of any tank vehicle shall not leave the vehicle while it is being filled or discharged. Delivery hose, when attached to a tank vehicle, shall be considered a part of the tank vehicle.

iv.d. Engine of tank vehicles shall be shut down during making or breaking hose connections. If loading or unloading is done without the use of a power pump, the tank vehicle motor shall be shut down throughout such operations.

iv.e. Cargo tank or a compartment thereof used for the transportation of any flammable or combustible liquid shall not be loaded liquid full. The unfilled space (outage) in a cargo tank or compartment thereof used in the transportation of combustible liquids shall in no case be less than one percent (1%). Sufficient space (outage) shall be left vacant in every case to prevent leakage from or

distortion of such tank or compartment by expansion of the contents due to rise in temperature in transit.

- iv.f. The driver, operator or attendant of any tank vehicle shall, before making delivery to any tank, determine the unfilled capacity of such tank by a suitable gauging device. To prevent overfilling, he shall not deliver in excess of that amount.
- iv.g. During loading, hatch covers shall be secured on all compartments except in the receiving compartments.
- iv.h. Delivery of Class I liquids to underground tanks of more than three thousand eight hundred liters (3,800 l) capacity shall be made by means of mechanically tight connections between the hose and the fill pipe.
- iv.i. Where a cargo tank is filled through bottom loading, a positive means shall be provided for loading a predetermined quantity of liquid and an automatic secondary shut-off control shall be installed in each compartment to prevent overfill. The secondary shutoff control system shall be labeled as to manufacturer and type and any electrical system used for secondary shut-off shall be in accordance with Philippine Electrical Code.
- iv.j. No material shall be loaded into or transported in a tank vehicle at a temperature above its ignition temperature unless properly safeguarded in an approved manner.
- iv.k. The cargo tank shall be bonded to the fill stem or to some part of the rack structure, electrically interconnected with the fill-stem piping, except tank vehicles loading any flammable or combustible liquids through bottom connections and tank vehicles used exclusively for transporting Class II and Class III liquids when loaded at locations where no Class I liquids are handled.
- iv.l. The cargo tank shall be bonded to the fill pipe when loading. The bond-wire connection shall be made prior to opening the dome covers. It shall be maintained in place during the entire filling operation and the dome covers shall be securely closed before the bond wire is disconnected from the cargo tank.
- iv.m. No external bond-wire connection or bond-wire integral to a hose shall be needed for the unloading of flammable and combustible liquids into underground tanks or when a

tank vehicle is loaded or unloaded through tight connections to an aboveground or through bottom connections.

v. Vapor recovery process

- v.a. In all cases where underground tanks are equipped with any type of vapor recovery system, all connections shall be safe and designed to prevent release of vapors at grade level and shall remain connected throughout the loading and unloading process.
- v.b. For bottom loading vehicles, where vapor recovery is not required, the tank vapor system shall be open to the atmosphere to prevent pressurization of the tank and the vapor system.
- v.c. The vapor recovery connection of the bottom-loading tank vehicles equipped with a vapor recovery system shall be used to lead vapor away from the loading area using terminal vapor recovery system, discharge standpipe, or by opening the tank fill opening (manholes).
- v.d. Where a "dry disconnect vapor recovery adapter" is used, provisions shall be made to ensure that the vapor recovery system is fully vented before unloading to prevent collapse of the tank.

vi. Parking and Garaging

- vi.a. No person shall leave a tank vehicle unattended on any street, highway, avenue or alley;
- vi.b. No person shall park a tank vehicle at any one point for longer than one (1) hour except:
 - Off a street, highway, avenue or alley.
 - Inside a bulk plant and seven and a half meters (7.5 m) from the property line or within a building approved for such use.
 - At other approved locations not less than fifteen meters (15 m) from any building except those approved for the storage or servicing of such vehicles.
 - When, in case of breakdown or other emergency, the operator must leave the vehicle to take necessary action to correct the emergency.

vi.c. Tank vehicles shall not be parked or garaged in any building other than those specifically approved for such use by the concerned agency.

b. On Fire Protection and Other Safety Measures

- i. Tank vehicles used for the transportation of any flammable or combustible liquids, regardless of the quantity being transported, whether loaded or empty shall be conspicuously and legibly marked. Such markings shall display the following:
 - i.a. Vehicle manufacturer;
 - i.b. Manufacturer's serial number;
 - i.c. Date of manufacture;
 - i.d. Original test date;
 - i.e. Certificate date;
 - i.f. Design pressure;
 - i.g. Head material;
 - i.h. Shell material;
 - i.i. Weld material;
 - i.j. Lining material;
 - i.k. Nominal tank capacity by compartment;
 - i.l. Maximum product load;
 - i.m. Loading limits;
 - i.n. Unloading limits;
- ii. These markings shall not be modified, obstructed, made inaccessible or unreadable by paints or any fixtures.
- iii. Installation of any plate onto the tank with these markings shall not compromise the safety of the tank.
- iv. Placards/ warning signs shall comply with NFPA 704, "*Standard System for the Identification of the Hazards of Materials for Emergency Response*" and/or other internationally accepted standard for signage. The size of signage shall measure at least two hundred seventy three millimeters (273 mm) on both sides and have a thirteen millimeters (13 mm) inner solid line border. The text indicating the hazard and the hazard class should be at least forty-one millimeters (41 mm).
- v. In addition to the markings and warning signs, a certification signed by a responsible official of the manufacturer of the cargo tank, or from a competent testing agency, certifying that each cargo tank is designed, constructed, and tested in compliance with NFPA 385, "*Standard for Tank Vehicles for Flammable and Combustible Liquid*" and applicable standards and such certification shall be retained in the files of the carrier

at all times that such cargo tank is engaged in the transport of flammable and combustible liquids.

- vi. Smoking is prohibited while driving, making deliveries, filling or making repairs to tank vehicles.
- vii. While loading or unloading, extreme care shall be taken to keep away fire and to prevent persons in the vicinity from smoking, lighting matches, or carrying any flame or lighted cigar, pipe or cigarette.
- viii. Each tank vehicle shall have at least one (1) unit of twenty pounds (20 lb) or two (2) units of ten pounds (10 lbs) BC-rating portable fire extinguisher.
- ix. Fire extinguishers shall be kept and maintained in good operating conditions at all times. They shall be visibly located in an accessible place on each tank vehicle and shall be protected from damage and impact.
- x. Trailer/tank vehicle operators, contractors, drivers, handlers and crews shall have undergone proper qualification by a concerned agency. Crews shall include repair and maintenance personnel.

B. Fire Safety Clearance

A Fire Safety Clearance shall be obtained from the City/Municipal Fire Marshal having jurisdiction for the following:

- 1. Storage, handling or use of Class I flammable liquids in excess of three and eight tenths liters (3.8 ℥) in any dwelling or other place of human habitation; or in excess of nineteen liters (19 ℥) in any other building or other occupancy; or in excess of thirty eight liters (38 ℥) outside of any building, except:
 - a. Storage or use of flammable liquids in the fuel tank of a motor vehicle, aircraft, motorboat, mobile power plant or mobile heating plant.
 - b. Liquids used for building maintenance, painting, or other similar infrequent maintenance purposes shall be permitted to be stored temporarily in closed containers safely secured outside of storage cabinets or inside storage area, limited to an amount that does not exceed six (6) days supply at anticipated rates of use.
- 2. Storage, handling, or use of Class II or III liquids in excess of ninety five liters (95 ℥) in a building; or in excess of two hundred twenty seven liters

(227 l) outside a building except for fuel oil used in connection with oil burning equipment.

3. Installation and use of equipment and premises for the storage, handling, use or sale of flammable or combustible liquids as herein stipulated. The required permit shall be obtained prior to the commencement of any work, installation, use of equipment or premises for the storage and handling and sale of combustible and flammable liquids.
4. A material safety data sheet (MSDS) shall be a pre-requisite in the application of such fire clearance.
5. Prior to removal, abandonment, place temporarily out of service or otherwise disposal of any flammable or combustible liquid tank. For this purpose a proper disposal and/or abandonment procedure shall be submitted.
6. Where more than one hundred (100) drums of flammable and/or combustible liquids are to be stored outside of the buildings, plans of storage area and building structures shall be submitted showing methods of storage, quantities to be stored, distance from buildings and property lines, access ways between group of drums, fire protection facilities, and provisions for drainage and runoff.

SECTION 10.3.4.3 GAS

In order to handle variety of gases effectively, consider classification of gases which based on the physical property and primary use. Gases are classified as cryogenic, compressed and liquefied.

SECTION 10.3.4.3.1 CRYOGENIC FLUIDS

Cryogenic fluids except those used as refrigerants in refrigerating systems shall be stored, handled and transported as follows:

A. Storage and Handling

1. Cryogenic Fluids shall be stored inside containers with the following design:
 - a. Containers used for the storage and handling of cryogenic fluids shall be in accordance with the materials and design requirements set forth in the Philippine Society of Mechanical Engineers (PSME) Code, particularly Chapter 7 for boilers and pressure vessels, or with the applicable standards of the Department of Energy (DOE) and/or Department of Trade and Industry (DTI), or other concerned government agencies.

- b. Metallic containers shall be built, inspected and tested in accordance with applicable provisions of the PSME Code for Design and Construction of Large, Welded, Low-Pressure Storage Tanks, depending on the temperature and pressure of the product stored.
- c. Concrete containers shall be built in accordance with the applicable provisions of the National Building Code. Barrier materials used in connection with concrete but not functioning structurally shall be made of materials authorized by the PSME Unfired Pressure Vessel Code.
- d. Pressurized containers shall be protected by a pressure-relieving device or devices. If only one pressure relief device is used, it shall be set to operate at a pressure not to exceed the Maximum Allowable Working Pressure (MAWP). Additional relief devices may be set to operate at a higher pressure but shall not exceed one hundred ten percent (110%) of the MAWP.
 - i. Containers that may be subjected to an exposure to fire hazards shall be protected by pressure relieving devices designed to protect against excessive pressure caused by such exposures. Such devices shall be set to operate at a pressure not in excess of one hundred ten percent (110%) of the MAWP, and shall have a relieving capacity sufficient to prevent the pressure from rising more than twenty percent (20%) above the MAWP. If only one device is used, it shall be set to operate at a pressure not to exceed the MAWP.
 - ii. Relief devices shall be located so that they are readily accessible for inspection and repair and shall be protected against tampering. All relief devices shall be so designed or located to prevent accumulation of moisture and freezing which would interfere with the proper operation of the device.
 - iii. No shutoff valves shall be installed between relief valves and container except that shutoff valves may be used on multiple valve installations where the arrangement of the valves will provide the required flow through the relief devices at all times.
 - iv. Outer containers shall be equipped with pressure and vacuum relief devices or rupture discs to adequately protect the container.
 - v. Heat exchangers and similar vessels shall be protected with a relieving device of sufficient capacity to avoid pressure in case of an internal failure.

- vi. Safety relief valves shall normally be mounted in a vertical position and shall not be subjected to low temperature except when operating.
- e. Containers shall be provided with substantial concrete or masonry foundations, or structural steel supports on firm concrete or masonry foundations. Foundations and supports shall be of a material and design to withstand the low temperature effects of cryogenic fluid spillage. Structural steel supports, above forty-six centimeters (46 cm) in height, or flammable cryogenic fluid container shall be protected with protective coating having a fire-resistance rating of two (2) hours.
- f. Horizontal containers shall be so mounted on foundations as to permit expansion and contraction. Every container shall be supported to prevent the concentration of excessive loads on the supporting portion of the shell. That portion on the container in contact with foundation or saddles shall be protected against corrosion.
- g. Secure anchorage or elevation of container shall be provided in an area that may be subjected to flooding.
- h. Storage containers, piping, valves, regulating equipment, and other accessories shall be protected against physical damage and against tampering.
- i. Containers shall be secured as may be necessary to prevent shifting or upset.

2. Containers shall be equipped with drainage, dikes and walls having the following conditions:

- a. The area surrounding a container for cryogenic fluids shall be diked to prevent accidental discharge of fluids thereby endangering adjacent containers, buildings and equipment, adjoining property or reaching waterways.
- b. Drainage shall be provided at a slope of not less than one percent (1%) away from the container towards an impounding basin or an appropriate means of disposal having a capacity equal to the container being served. This termination area and the route of the drainage system shall be so located that a fire occurring in drainage system will not seriously endanger adjacent containers or property.
- c. Where diked areas are utilized to provide the required protection, the following shall apply:

- i. More than one container may be installed in a single area provided:
 - i.a. The usable volume of the enclosure shall be at least one hundred percent (100%) of the capacity of the largest container enclosed,
 - i.b. Containers shall be elevated above grade so that cryogenic liquids will not reach the outside container wall in the event of a liquid spill, or
 - i.c. If cryogenic liquids can reach the outside container wall, the material that can be wetted by spilled liquid shall be suitable for use at the temperature of the liquid with the lowest normal boiling point within the enclosure.
- ii. Dike walls shall be of earth or other materials compatible to the fluid stored, designed to be liquid tight, and to withstand thermal shock.
- iii. The dike and diked area shall be kept clear of all weeds, grass, and other combustible materials.
- iv. Containers of cryogenic fluids shall not be located within dikes enclosing flammable or combustible liquid containers, liquefied petroleum gas (LPG) containers or compressed gas containers.

3. Location of Aboveground Containers with Respect to Exposure

- a. A cryogenic fluid container or containers with an aggregate capacity in excess of seven hundred fifteen thousand liters (715,000 ℓ) and their loading stations shall be located at a minimum of fifteen meters (15 m) from a building utilized for the production of such fluids. Such container or containers and their loading stations shall be located a minimum of thirty meters (30 ℓ) from aboveground storage of flammable or noncombustible liquids and from any building of such construction or occupancy which constitute an exposure of hazard to a container in the event of fire or explosion in said buildings. When the capacity is seven hundred fifteen thousand liters (715,000 ℓ) or less, the distance required from aboveground storage of flammable or combustible liquids and buildings which constitute an exposure to hazard shall be based on the capacity of the container or containers and the physical features of the installation with three meters (3 m) being the minimum distance allowed.
- b. The minimum distance from the edge of a flammable cryogenic container having a capacity in excess of seven hundred fifteen thousand liters (715,000 ℓ), to the nearest building or group of

buildings not associated with the cryogenic liquid plant, or to the property line of public way shall be sixty meters (60 m). In no case shall the distance from the dike surrounding the container or the distance from a drainage area be less than thirty meters (30) from the nearest building or group of buildings or the property line or public way.

- c. Flammable cryogenic fluid container with a capacity of eleven thousand liters (11,000 l) or less shall be located in accordance with NFPA 50A, *"Standard for Gaseous Hydrogen Systems at Consumer Sites."*
- d. Containers and equipment used in the storage and handling of liquid oxygen shall be installed and maintained in accordance with NFPA 55, *"Standard for the Storage, Use, and Handling of Compressed and Liquefied Gases in Portable Cylinders."*

4. Installation of Belowground Concrete Containers

- a. Belowground concrete containers shall be installed on foundation or support of concrete, masonry piling, steel or a suitable foundation of aggregate and shall be designed and constructed in accordance with the National Building Code of the Philippines.
- b. The container storage area shall be fenced or otherwise protected. A minimum of two (2) access openings shall be provided and they shall be of sufficient size to accommodate emergency equipment.

5. Installation of Cryogenic Inground Containers

- a. Natural materials such as earth shall be proven to have adequate chemical and physical properties for the construction and operation of the container at the operating temperature.
- b. Containers shall be bottomed out in material naturally impermeable or made impermeable by other approved means based on internationally accepted standards.
- c. Any foundation, such as those for the superstructure of roof, shall be properly designed and constructed in accordance with the National Building Code of the Philippines.
- d. The container storage area shall be constructed with masonry fence or otherwise protected with equally or stronger type of construction. A minimum of two (2) access openings shall be provided and they shall be of sufficient size to accommodate emergency equipment.

6. Location of Belowground and Inground Containers with Respect to Exposure

a. The minimum distance from the edge of belowground and inground flammable cryogenic containers to the nearest important building, property line or public way from aboveground flammable or combustible liquid shall be in accordance with the **Table 24** below:

Table 24: MINIMUM DISTANCE FROM THE EDGE OF BELOWGROUND AND INGROUND CRYOGENIC CONTAINERS BASED ON CONTAINER CAPACITY

CONTAINER CAPACITY	MINIMUM DISTANCE
a. Less than one thousand nine hundred (1,900) liters	a. One hundred fifty five (155) centimeters
b. One thousand nine hundred (1,900) liters to three thousand eight hundred (3,800) liters	b. Seven and three-fourth (7.75) meters
c. Over three thousand eight hundred (3,800) liters	c. Fifteen and a half (15.5) meters

7. Pressure Relief Vent Piping

a. The piping of all relief vents shall be at least equal to the area of opening of the relief valve and so arranged as not to unduly restrict the flow.

b. Relief devices and/or relief device vents shall be so arranged that escaping gas will discharge unobstructed to the open air and not impinge on personnel, containers, equipment and structures or enter enclosed spaces.

c. Vents shall be installed in such a manner as to exclude or remove moisture and condensate, and to prevent malfunction due to freezing or icing. Drains shall be so installed as to prevent possible flame impingement on the container, piping, equipment and structures.

8. Dispensing of flammable cryogenic fluids, liquefied, or liquid oxidizers shall be at locations not less than one and a half meter (1.5 m) in any direction away from any exterior source of ignition, openings into direct-vent (sealed combustion system) appliances, or mechanical ventilation air intakes.

9. Piping, Materials and Construction

- a. All pipings and materials such as gaskets, thread compound, etc., shall be suitable for the intended use through the full range of pressure and temperature to which they will be subjected, maintaining a safety factor of four (4) to one (1).
- b. The piping system shall be designed and constructed to provide adequate allowance for expansion, contraction, vibration, settlement, and fire exposure.
- c. Joints on all container piping and tubing over five (5) centimeters in nominal diameter shall be made by welding or with welded flanges.
- d. Piping outside buildings may be either buried or aboveground. In either case, it shall be well supported and protected against physical damage and corrosion.
- e. All piping and tubing shall be tested after installation, at not less than one and one-half (1 ½) times hydraulically, or one and one fourth (1 ¼) times pneumatically, the maximum working pressure and proven free of leaks.

B. Equipment and Devices

1. All cryogenic containers, equipment and devices used for the storage, handling and transportation of cryogenic fluids shall be of approved type. Approved types are those covered with appropriate certification from its manufacturers and/or certifying authority concerned.

2. Electrical Equipment

- a. Electrical installations and equipment shall conform to the provisions of the Philippine Electrical Code, equipment manufacturers' instruction and/or other applicable international standards as deemed necessary.
- b. Proper lighting, including emergency lights shall be provided for fire protection appliances and operating facilities such as walkways, control valves, gauges, and similar devices or servicing facilities for the cryogenic fluids.

3. Electrical Grounding or Bonding

- a. Containers, systems, and equipment used for flammable cryogenic fluids shall be grounded and/or bonded in accordance with NFPA 77, "Recommended Practice on Static Electricity," and the

Philippine Electrical Code. Suitable means shall be taken to protect the system against corrosion, including corrosion caused by stray electric currents.

- b. Containers and systems containing cryogenic fluids shall be equipped with lightning protection when installed outside the building/ structure.

4. Valves and Accessory Equipment

- a. All valves and equipment shall be suitable for the intended use at the temperature of the application and shall be designed for not less than the maximum pressure and the minimum temperature to which they may be subjected, maintaining a safety factor and four (4) to one (1).
- b. Shutoff valves shall be provided on all container connections. Shutoff valves shall be located as close as practicable to the container.
- c. All liquids and vapor connections on flammable cryogenic fluid containers, except relief and gauging connections over twelve millimeters (12 mm) pipe size, shall be equipped with check valves, or remotely controlled automatic quick-closing valves, and shall remain closed except during operating periods.
- d. Shutoff valves shall be installed in the piping system as needed to limit the volume of liquids discharged in the event of piping or equipment failure. Relief valves shall be installed between shutoff valves in all pipelines.
- e. All inlet and outlet connections, except relief valves, liquid level gauging devices, and pressure gages on any container, shall be labeled to designate whether they are connected to vapor or liquid space.

C. Warning Labels

1. Warning labels and signs shall be posted visibly from any direction of approach on cryogenic containers and equipment. In addition, they shall be properly marked with the name of the specific cryogenic fluid, manufacturer/ supplier and contact details.
2. The name of the specific cryogenic fluid shall be conspicuously affixed at the entrances to locations where they are stored, handled, used, or dispensed, and at such other locations as may be designated by the City/Municipal Fire Marshal having jurisdiction.

3. Warning labels and signs shall adopt the hazard identification signs as set forth in NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*.

4. Signs and markings shall not be obscured or removed,

5. Markings on Containers

Each container shall be identified by the attachment of a nameplate in an accessible place marked with the following information:

- a. Builder's name and date built
- b. Nominal capacity, in liters
- c. MAWP
- d. Maximum permissible specific gravity of liquid to be stored
- e. Maximum level to which container may be filled with stored liquid
- f. Maximum level to which container may be filled with water for container was designed
- g. Minimum temperature in degrees Celsius (Centigrade) for which container was designed

6. Vehicles transporting cryogenic fluids shall be labeled at the front, rear and on each side identifying the product. Labels/placards shall have letters not less than four inches (4 in) in height using approximately a five-eight inch (5/8 in) stroke. Abbreviations shall not be used. In addition to the label/placard identifying the product, vehicles shall also bear "FLAMMABLE GAS", or "OXIDIZER".

D. Safety Measures

1. Insulation shall be non-combustible and shall be non-reactive with oxygen-enriched air.
2. A positive alarm or other approved device based on internationally accepted standard shall be provided to warn against overfilling.
3. Vehicles transporting cryogenic fluids shall be equipped with at least one (1) unit of approved type fire extinguisher, with a minimum rating 20-B, C; and with adequate chock blocks.

E. Fire Safety Clearance

1. A Fire Safety Clearance shall be obtained from the City/Municipal Fire Marshal having jurisdiction, for the following:

a. Manufacture, storage or sale of cryogenic fluids;

b. Transportation on the highway of flammable cryogenic fluids in excess of four hundred fifty liters (450 l);

- c. Transportation on the highway of liquefied oxygen or cryogenic oxidizers in excess of four hundred fifty liters (450 l).
- d. Storage and transporting of non-flammable nontoxic cryogenic fluids in excess of one thousand nine hundred liters (1,900 l).
- e. Storage or use of more than thirty eight liters (38 l) of liquefied oxygen, flammable cryogenic fluids or cryogenic oxidizers.

2. Materials Safety Data Sheet (MSDS) shall be a pre-requisite to the issuance of the required Fire Safety Clearance.

Table 25: PROPERTIES OF CRYOGENIC FLUIDS

GAS	BOILING POINT		VOLUME EXPANSION TO GAS	FLAMMABLE	TOXIC	ODOR
	°C	°F				
HELIUM-3	-269.9	453.8	757 TO 1	NO	NO ^(A)	NO
HELIUM-4	-268.9	-452.0	757 TO 1	NO	NO ^(A)	NO
HYDROGEN	-252.7	-422.9	851 TO 1	YES	NO ^(A)	NO
DEUTERIUM	-249.5	-417.1	...	YES	RADIOACTIVE	NO
TRITIUM	-248.0	-414.4	...	YES	RADIOACTIVE	NO
NEON	-245.9	-410.6	1,438 TO 1	NO	NO ^(A)	NO
NITROGEN	-195.8	-320.4	696 TO 1	NO	NO ^(A)	NO
CARBON MONOXIDE	-192.0	-313.6	...	YES	YES	NO
FLUORINE	-187.0	-304.6	888 TO 1	NO	YES	SHARP
ARGON	-185.7	-302.3	847 TO 1	NO	NO ^(A)	NO
OXYGEN	-183.0	-297.4	860 TO 1	NO	NO ^(A)	NO
METHANE	-161.4	258.5	578 TO 1	YES	NO ^(A)	NO
KRYPTON	-151.8	-241.2	700 TO 1	NO	NO ^(A)	NO
TETRAFLUOROMETHANE	-128.0	-198.0	...	NO	YES	NO
OZONE	-111.9	-169.4	...	YES	YES	YES
XENON	-109.1	-164.4	573 TO 1	NO	NO ^(A)	NO
ETHYLENE	-103.8	-154.8	...	YES	NO ^(A)	SWEET
BORON TRIFLUORIDE	-100.3	-148.5	...	NO	YES	PUNGENT
NITROUS OXIDE	-89.5	-129.1	666 TO 1	NO	NO ^(A)	SWEET
ETHANE	-88.3	-126.9	...	YES	NO ^(A)	NO
HYDROGEN CHLORIDE	-85.0	-121.0	...	NO	YES	PUNGENT
ACETYLENE	-84.0	-119.2	...	YES	YES	GARLIC

GAS	BOILING POINT		VOLUME EXPANSION TO GAS	FLAMMABLE	TOXIC	ODOR
	°C	°F				
FLUOROFORM	-84.0	-119.2	...	NO	NO ^(A)	NO
1,1-DIFLUOROETHYLENE	-83.0	-117.4	...	YES	NO ^(A)	ETHER
CHLOROTRIFLUOROMETHANE	-81.4	-114.5	...	NO	YES	MILD
CARBON DIOXIDE	-78.5 ^(B)	-109.3	553 TO 1	NO	YES ^(A)	PUNGENT
0°C = 32°F.						
(A) NONTOXIC, BUT CAN ACT AS AN ASPHYXIANT BY DISPLACING AIR NEEDED TO SUPPORT LIFE. AS WITH MOST CHEMICALS, EVEN HARMLESS MATERIALS CAN BE TOXIC OR POISONOUS IF TAKEN IN SUFFICIENT QUANTITIES UNDER THE RIGHT CIRCUMSTANCES.						
(B) SUBLIMES.						

SECTION 10.3.4.3.2 MEDICAL AND RELATED COMPRESSED GASES

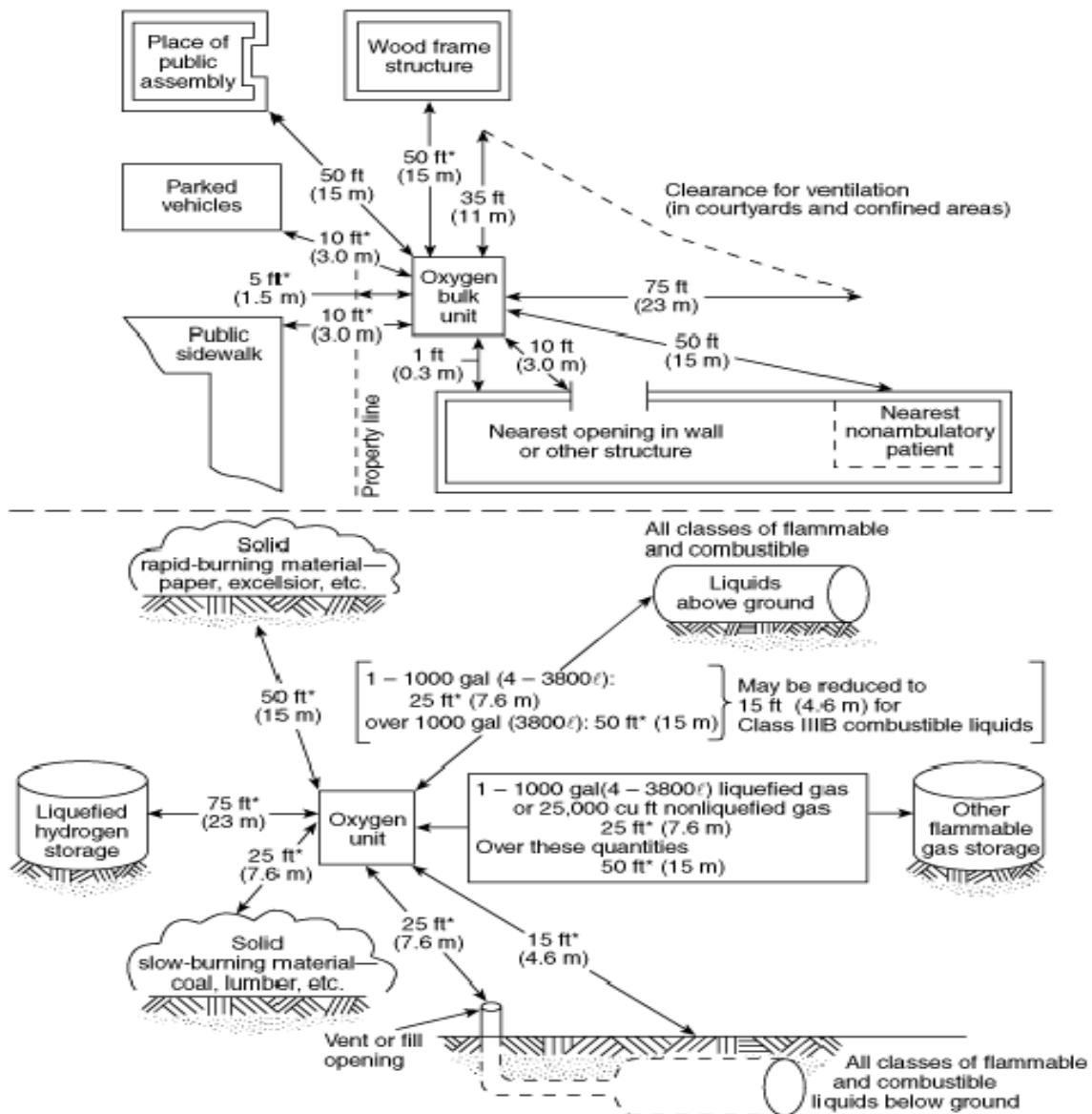
Medical and related compressed gasses such as flammable anesthetic; non-flammable medical gases in hospitals, medical schools, laboratories and similar facilities; bulk oxygen in industrial and healthcare consumer sites; and other compressed gases of similar and related uses shall be stored, handled, transported and manufactured as follows:

A. On Storage and Handling

1. All compressed gas containers, shall be stored in an upright position with the valve end up. For non-liquefied gases, the axis of the container shall be limited to forty-five degrees (45°) from the vertical provided that it is properly secured except, when it is empty, its content is less than five liters (5 ℥) or the container is designed for use in a horizontal position.
2. Racks or fastenings shall be made to protect cylinders from accidental damage or dislocation.
3. Indoor and outdoor storage of compressed gases shall comply with the material-specific requirements provided in the MSDS or manufacturer's technical specifications/ data or other applicable provisions of this IRR.
4. Indoor storage, use areas and storage buildings shall be provided with mechanical exhaust ventilation or natural ventilation. When mechanical ventilation is provided, the system shall be operational during such time as the building or space is occupied.

5. Compressed gases shall be stored in areas dedicated to the storage of such gases without other storage or uses. If containers of compressed gases in quantities greater than the maximum allowable quantity per control area, said containers shall be stored in a room or a gas cabinet with two (2) hour resistance rating located inside buildings or structures, with the following conditions:
 - a. For rooms:
 - i. Openings between the room and interior spaces shall be protected by self-closing smoke and draft-control assemblies having a fire protection rating of not less than 2 hours.
 - ii. Rooms having exterior walls shall be provided with at least two vents in such walls, each having not less than twenty three hundredths square meter (0.023 m^2) free area. One vent shall be within one hundred fifty two millimeters (152 mm) of the floor and one shall be within one hundred fifty two millimeters (152 mm) of the ceiling.
 - iii. Rooms with no exterior walls shall be exhausted through a duct to the outdoors. Supply and exhaust ducts shall be enclosed in a one (1) hour rated shaft enclosure from the room to the outdoors.
 - iv. Approved mechanical ventilation shall comply with the requirements of the Philippine Mechanical Code and be provided at a minimum rate of five hundred eight thousandth cubic meter per second per square meter [$0.00508\text{ m}^3/(\text{s}\cdot\text{m}^2)$] of the area of the room.
 - v. Rooms shall be protected by an approved, supervised sprinkler system.
 - b. For gas cabinets:
 - i. The average velocity of ventilation at the face of access ports or windows shall not be less than sixty one meters per second (61 m/s), with a minimum of forty six meters per second (46 m/s) at any point of the access port or window to maintain the temperature of the cylinders at fifty four degree Celsius (54°C).
 - ii. Connected to an exhaust system.
 - iii. Internally protected by a sprinkler system.
6. The storage of compressed gases located outdoors in quantities greater than the allowable amount shall be located as shown in the figure;

Figure 1: STORAGE OF COMPRESSED GASES OUTDOORS



These distances do not apply where protective structures having fire resistance rating of two (2) hours interrupt the line-of-sight between un-insulated portions of the bulk oxygen storage installation and the exposure. The protective structures protect un-insulated oxygen storage containers or supports, control equipment, and system piping (or parts thereof) from external fire exposure. Liquid oxygen storage containers are insulated. Such containers may provide line-of-sight protection for un-insulated system components. Interruption of the line-of-sight means that an "eye" on any part of the un-insulated portion of the bulk oxygen storage installation cannot "see" any part of the exposure.

7. Cylinders on Medical Gas Storage containing compressed gases and containers for volatile liquids shall be kept away from radiators, steam piping, and like sources of heat. When cylinder valve protection caps are supplied, they shall be secured tightly in place unless the cylinder is connected for use. Containers shall not be stored in a tightly closed space such as a closet.
8. Compressed gas systems shall be suitable for the intended use, designed and installed by qualified practitioners recognized by the BFP. For this purpose, training certificate of the person in charge shall be required prior to the issuance of the fire clearance by the BFP.
9. Materials, devices and appurtenances used in compressed gas systems shall comply with the DTI Product Standards or covered by an International Commodity Clearance (ICC). This does not limit the use of other materials, devices and appurtenances that are legally acquired and complying with other internationally accepted standards, qualified and recognized by the Chief, BFP.
10. Compressed gas system controls shall be so designed to prevent materials from entering or leaving process or reaction systems at other than the intended time, rate or path. Automatic controls shall be designed to be fail-safe.
11. Piping, including tubing, valves, fittings and pressure regulators, shall comply with the requirements of hazardous materials and chemicals handling. Piping, tubing, pressure regulators, valves and other apparatus shall be kept gas-tight to prevent leakage. Adequate pressure-relief devices shall be provided where refrigerated liquefied gas can become trapped in the piping.
12. Valves utilized on compressed gas systems shall be suitable for the use intended and shall be accessible. Valve handles or operators for required shutoff valves shall not be removed or otherwise altered to prevent access or hinder operation.
13. Venting of gases shall be directed to an approved location. Venting shall comply with the requirements of the Philippine Society of Mechanical Engineering (PSME) Code.
14. Compressed gas containers, except those designed for use in a horizontal position, and all compressed gas containers containing non-liquefied gases, shall be used in an upright position with the valve end up. The axis of a container being used in an upright position may be inclined as much as forty-five degrees (45°) from the vertical provided that it is properly secured. Use of nonflammable liquefied gases in the inverted position when the compressed gas is in the liquid state shall

be allowed provided that the container is properly secured and the dispensing apparatus is designed for such liquefied gas use.

Exception: compressed gas containers with an internal volume less than five thousandth cubic meter (0.005 m³) may be used in a horizontal position.

15. The handling of compressed gas containers shall comply with the following requirements:

- a. **Carts and trucks.** Containers shall be moved using an approved method. Where containers are moved by hand cart, hand truck or other mobile device, such carts, trucks or devices shall be designed for the secure movement of containers. Carts and trucks utilized for moving compressed gas containers outdoors shall be so designed that the containers will be secured against dropping or otherwise striking against each other or other surfaces.
- b. **Lifting of containers.** Ropes, chains or slings shall not be used to suspend compressed gas containers unless such containers have been designed for such handling. Valves of compressed gas containers shall not be used for lifting.

16. Compressed gas containers, equipment and devices used for the storage, handling and transportation of compressed gases shall be of approved type.

17. Approved containers, equipment or devices are those covered with appropriate certification from its manufacturers and/or certifying authority concerned.

18. Electrical installations and equipment shall conform to the provisions of the Philippine Electrical Code, equipment manufacturers' instruction and/or other applicable international standards as deemed necessary.

19. Proper lighting, including emergency lights shall be provided to illuminate fire protection appliances and operating facilities such as walkways, control valves, gauges, and similar devices or servicing facilities for the compressed gas

20. Lighting equipment and facilities shall be of explosion proof type.

21. Container design and construction shall be maintained as follows:

- a. Compressed gas containers shall be designed and fabricated in accordance with the specifications of the PSME Boiler and Pressure Vessels Code or shall comply with appropriate standards of the DOE and DTI.

- b. Compressed gas containers that are not designed for refillable use shall not be refilled after use of the original contents.
- c. Partially full compressed gas containers containing residual gases shall be considered as full for purposes of the controls required.

B. On Manufacturing

- 1. The compressor air intake shall be located where no contamination from engine exhausts, fuel storage vents, vacuum system discharges, particulate matter, or odor of any type is anticipated.
- 2. The intake to medical air compressors shall be located outdoors above roof level at a minimum distance of three meters (3 m) from any door, window, exhaust, other intake, or opening in the building, and a minimum distance of six meter (6 m) above the ground. Intakes shall be turned down and screened or otherwise be protected against the entry of vermin or water, with screening that shall be fabricated or composed of a non-corrosive material such as stainless steel or other suitable material.
- 3. Ventilating systems having fans with motors or drive belts located in the air stream shall not be used as a source of medical air intake.
- 4. Two or more compressors shall be installed as alternate for simultaneous demand. Compressors shall be sized to serve peak demand with the largest compressor out of service.
- 5. A device shall be provided to automatically activate the additional compressors if the unit in operation is incapable of adequately maintaining pressure. A signal indicating that the reserve compressor is running shall operate a local audio and visual alarm and serve to activate remote master alarms.
- 6. Compressors shall be provided with automatic or manual alternation to allow division of operating time. If automatic alternation of compressors is not provided, the facility shall arrange a proper schedule for manual alternation.
- 7. Each compressor shall be provided with a dedicated disconnect switch, motor starting device, and overload protection. The disconnect switches shall be installed in the electrical circuit ahead of each motor starter. Where compressor systems having two or more compressors employ a control transformer or other voltage control power device, at least two such devices shall be provided. Control circuits shall be arranged in such a manner that the shutdown of one compressor does not interrupt the operation of another compressor.
- 8. Inflatable equipment, devices or balloons shall be pressurized or filled only with nonflammable gases.

9. Containers, systems, and equipment used for flammable compressed gases shall be grounded and/or bonded in accordance with the Philippine Electrical Code. Suitable means shall be taken to protect the system against corrosion including corrosion caused by stray electric currents.
10. Containers and systems containing compressed gas under pressure are not required to be equipped with lightning protection.
11. Compressed gas containers and systems shall be secured and protected against physical damage and tampering, and unauthorized entry and safeguarded in accordance with the following:
 - a. **Physical protection.** Compressed gas containers and systems that could be exposed to physical damage shall be protected. Barriers, posts and/or other approved means of protection shall be provided to protect containers, systems indoors, and outdoors from any hazards and/or damages.
 - b. **Securing compressed gas containers.** Compressed gas containers shall be secured to prevent movement from contact, vibration or seismic activity, utilizing one or more of the following methods:
 - i. Securing containers to a fixed object with one or more noncombustible restraints. Containers shall not be secured to plumbing systems or electrical conduits.
 - ii. Securing containers on a cart or other mobile device designed for the movement of compressed gas containers.
 - iii. Nesting of compressed gas containers at container filling or servicing facilities or in seller's warehouses not accessible to the public shall be allowed provided the nested containers, if dislodged, do not obstruct any required means of egress.
 - iv. Securing of compressed gas containers to or within a rack, framework, cabinet or similar assembly designed for such use, except when the containers are in the process of examination, filling, transport or servicing.
 - v. Securing stationary compressed gas containers to a foundation designed for such use in accordance with the construction codes.
 - c. **Valve protection.** Compressed gas container valves shall be protected from physical damage by means of protective caps, collars, plugs or similar devices provided for the purpose. These devices shall always be in place except when the containers are in use or are being serviced or filled.

d. **Separation from hazardous conditions.** Compressed gas containers and systems in storage or use shall be separated from materials and conditions that present potential hazards to them, or to which they present potential hazards. Separation shall be by fire barrier of two (2) hours fire resistance rating and /or distance as shown Figure 1.

C. On Fire Protection and Markings

1. A written emergency plan to be implemented in the event of spill or leak shall be prepared, maintained on the premises and made available at all times.
2. Automatic fire extinguishment and fire detection systems, where required, shall be connected to the facility fire alarm system and shall be arranged to immediately sound an alarm.
3. Vehicles shall be labeled at the front, rear and on each side identifying the product labels/placards which shall have letter not less than one hundred two millimeters (102mm) in height using approximately a sixteen millimeters (16mm) stroke. Abbreviations shall not be used. A sign bearing the words "**COMPRESSED GAS**" or similar wording small be posted on vehicles transporting compressed gases.
4. Vehicles shall be equipped with not less than one (1) approved type of fire extinguisher with a minimum rating of 20-B and C.
5. Vehicles shall be equipped with adequate chock blocks.
6. Outdoor storage shall display precautionary sign, readable from a distance of one and five tenths meter (1.5 m) the following words:

**"CAUTION
OXIDIZING GASES STORED WITHIN
NO SMOKING
NO OPEN FLAME"**

7. Stationary compressed gas containers shall be properly marked as follows:
 - a. The name of the gas shall be visible from any direction of approach.
 - b. Hazard identification signs as set forth in NFPA 704, "Standard System for the Identification pf the Hazards of Materials for Emergency Response" for the specific material contained shall be conspicuously affixed on stationary containers and aboveground tanks and at entrances to locations where compressed gases are stored, handled or used, including dispensing.

- c. Signs reading "**COMPRESSED GAS**" shall be conspicuously posted at the entrance to rooms or on cabinets containing compressed gases.
- 8. Portable compressed gas containers shall be marked in accordance with the standards prescribed by DTI and DOE.
- 9. Markings used for piping systems shall consist of the name of the contents and include an arrow indicating direction of flow. Markings shall be provided at each valve; at wall, floor or ceiling penetrations; at each change of direction; and at a minimum of every six thousand ninety six millimeters (6096 mm) or fraction thereof throughout the piping run.
- 10. Piping that is designed or intended to carry more than one compressed gas at various times shall have appropriate signs or markings posted at the manifold, along the piping and at each point of use to provide clear identification and warning.
- 11. Piping within gas-manufacturing plants, gas-processing plants and similar occupancies shall be marked in an approved manner.
- 12. Out-of-service compressed gas containers shall be marked to indicate that they are no longer available for service.

D. **Fire Safety Clearance**

A Fire Safety Clearance shall be obtained from the City/Municipal Fire Marshal having jurisdiction, for the following:

- 1. Manufacture, storage or sale of compressed gases.
- 2. Transportation on the highway of flammable compressed gases in excess of four hundred fifty liters (450 l).
- 3. Transportation of non-flammable compressed gases in excess of one thousand nine hundred liters (1,900 l).
- 4. A Material Safety Data Sheet (MSDS) is a prerequisite in the application of such Fire Safety Clearance.

SECTION 10.3.4.3.3 LIQUEFIED PETROLEUM GASES

The storage, handling, transportation and protection of Liquefied Petroleum Gas (LPG) and the installation of all equipment related to its use shall comply the following requirements

A. **On Storage and Handling**

1. Storage containers for liquefied petroleum gas (LPG) shall be designed, fabricated, tested and marked or stamped in accordance with the applicable Philippine National Standards (PNS) and/or U.S. Department of Transportation (DOT) regulations, or ASME Boiler and Pressure Vessel Code, Section VIII, "Rules for the Construction of Unfired Pressure Vessels", or API-ASME *Code for Unfired Vessels for Petroleum Liquids and Gases* for bulk, stationary and portable containers.
2. No person shall install or maintain any LPG container, or operate any tank vehicle used for the transportation of LPG without a permit from the Department of Energy (DOE) and other concerned government agencies.
3. For the installation of portable LPG containers exceeding four hundred fifty four liters (454 l) water capacity but not more than four thousand five hundred forty liters (4,540 l) water capacity, the installer shall secure a Fire Safety Clearance from the City/Municipal Fire Marshal having jurisdiction. In case of a single container or the aggregate of interconnected containers exceeding four thousand five hundred forty liters (4,540 l) water capacity, the installer shall submit plans to the same BFP Official concerned.
4. No person shall install or maintain an LPG container with a capacity of four thousand five hundred forty liters (4,540 l) or less, within seven and a half meters (7.5 m) of any open flame device outside of buildings, nor shall any person install or maintain any such container with a capacity in excess of four thousand five hundred forty liters (4,540 l) within fifteen meters (15 m) of any such open flame device.
5. Installers shall maintain a record of all installations including those for which permits are not required by para "A" 3 above, but not including the installation of gas burning appliances and the replacement of portable cylinders and have it available for inspection by the City/Municipal Fire Marshal having jurisdiction.
6. In heavily populated or congested commercial areas, the aggregate capacity of LPG shall not exceed eight thousand liters (8,000 l) water capacity except that in particular installations, this capacity limit may be altered at the discretion of the City/Municipal Fire Marshal having jurisdiction, after consideration of special features such as proximity to building, capacity of proposed tanks, degree of private fire protection to be provided, facilities of the Local BFP Office, and provisions of local zoning ordinances.
7. Multiple container installation with a total storage of more than six hundred eighty thousand liters (680,000 l) water capacity or approximately five hundred sixty seven thousand liters (567,000 l) LPG capacity, shall be subdivided into groups of six hundred eighty

thousand liters (680,000 l) or five hundred sixty seven thousand liters (567,000 l) LPG capacity in each group. Such groups shall be separated by a distance of not less than fifteen meters (15 m) unless the tanks are:

- a. Mounted in an approved manner;
- b. Protected with approved insulation on such areas that may be subject to impingement of ignited gas from pipelines or other leakage;
- c. Protected by firewalls of approved construction,
- d. Protected by an approved system for the application of water; or
- e. Protected by other approved means.

Where one of these forms of protection is provided, the separation shall not less than seven and a half meters (7.5 m) between such container groups.

8. Storage and transportation of LPG, and the installation of all pertinent equipment shall be installed and maintained in accordance with NFPA 58, "Liquefied Petroleum Gas Code."
9. Containers installed outside of buildings, whether of the portable type replaced on a cylinder exchange basis or permanently installed and refilled at the installation, shall be located with respect to the adjacent containers, important building, group of buildings, or line of adjoining property that can be built upon, in accordance with **Table 26**:

Table 26: MINIMUM DISTANCES OF LPG CONTAINERS OUTSIDE BUILDINGS, BY WATER CAPACITY

WATER CAPACITY PER CONTAINER (in liters)	MINIMUM DISTANCES (in meters)		
	Mounded or Underground Containers	Aboveground Containers	Between Containers
Less than 500	3	0	0
500 to 1,000	3	3	0
Above 1,000 to 1,900	3	3	1
Above 1,900 to 7,600	3	7.6	1
Above 7,600 to 11,400	15	15	1.5
Above 11,400 to 26,500	15	23	$\frac{1}{4}$ of sum of diameters of adjacent containers
Above 26,500 to 34,100	15	30	
Above 34,100 to 45,400	15	38	
Above 45,400 to 75,700	15	61	
Above 75,700 to 378,500	15	91	
Above 378,500	15	122	

10. No stationary storage tank shall be less than three meters (3 m) from the nearest street line or sidewalk.

11. No person shall fill or maintain an LPG container with LPG in excess of the fixed outage gauge installed by the manufacturer or the weight stamped on the tank.

12. Outside bulk LPG storage and filling stations

- a. All LPG cylinders shall be provided with pressure relief valves, valve stem caps, protective collars and foot rings and shall be able to withstand the internal pressures in accordance with ASME Code on Unfired Pressure Vessels.
- b. Filling empty cylinders or transferring of LPG from one container to another is prohibited in areas outside authorized LPG bulk storage and filling facilities.
- c. Each delivery of LPG cylinders/tanks to replace empty ones at the end user's premises shall be accompanied by duly qualified technicians by concerned government agencies, who shall conduct a thorough test of the operable condition of the LPG appliance/set and the integrity of all its components/assemblies. If a defect is found, the empty LPG tank shall not be replaced, unless the defect is corrected.

B. On Transportation

1. The parking and garaging of tank vehicles used for the transportation of LPG shall comply with the provisions on parking and garaging of Tank Vehicles for Flammable and Combustible Liquids.
2. During the unloading or transfer of LPG, the tank truck shall be located or parked clear of a public thoroughfare, unless:
 - a. The failure to transfer would create a hazard; or
 - b. It is impossible due to topography.
3. LPG tank/cylinders shall be stacked in upright position and tied securely to the vehicle. Where two or more layers of cylinders are transported, such layers shall be provided with damage protection to separate one layer from the other. In no case shall filled cylinders be loaded on its side.
4. Trailer/tank vehicle operators, contractors, drivers, handlers and crews shall undergo proper qualification by concerned agency. Crews shall include repair and maintenance personnel.

C. Equipment and Appliances

1. All LPG equipment including such equipment installed at utility gas plants shall be installed in accordance with the provisions of NFPA 59, "*Liquefied Petroleum Gases at Utility Gas Plant*", manufacturer's instructions, applicable codes or practices and other internationally accepted standards, in addition to those explicitly prescribed in this IRR.
2. LPG shall not be used for operating any device or equipment unless such equipment or device is approved for use with LPG.
3. Delivery of LPG stove, burner, rotisseries and other LPG appliances to an end-user shall be accompanied by a technician duly trained and qualified by the Philippine Liquefied Petroleum Gas Association (PLPGA), Liquefied Petroleum Gas Industry Association (LPGIA) and/or the manufacturer, who shall personally install the equipment/appliance and teach the user on its safe use and maintenance.
4. LPG shall not be released to the atmosphere except through an approved liquid level gauge or other approved device.
5. Whenever the use of LPG equipment has been discontinued, they shall be abandoned in an approved manner within a period of thirty (30) days after securing a fire clearance from the City/Municipal Fire Marshal having jurisdiction.
6. Recommended abandonment procedures, which shall have prior approval of the City/Municipal Fire Marshal having jurisdiction, shall be as follows:
 - a. Removal of all LPG equipment.
 - b. Burn-off of the contents of containers.
 - c. Venting contents of containers to the atmosphere when the discharge of gas can lead to a safe point of discharge,
 - d. All service openings shall be capped or plugged after contents have been removed from the container.

D. On Fire Protection and Other Safety Measures

1. No person shall smoke nor install nor maintain any open flame devices outside of buildings within seven and a half meters (7.5 m) of any LPG container of four thousand five hundred forty liters (4,540 ℥) capacity or less, nor within fifteen meters (15 m) of any such container over four thousand five hundred forty liters (4,540 ℥) capacity.

2. No person shall tamper with or make ineffective the safety devices of any LPG container.
3. All weeds, grass, brush, trash or other combustible materials shall be kept at a minimum of three meters (3 m) away from all LPG tanks or containers.
4. In some installations, LPG cylinders are placed in compartments near the appliances. Such compartments, whether or not integral to the appliance, shall be aired/ventilated periodically during the day. No combustible or spark-producing objects shall be stored within the said compartments.
5. LPG cylinders shall not be placed directly adjacent to electrical convenience outlets and/or switches.
6. As a precaution, if the burner does not have an automatic igniter, a lighted matchstick shall be placed on the burner before the gas knob is turned on.
7. Tank/cylinder valves/regulators shall be closed after the LPG appliance is used.
8. All provisions of the Safety Code of the PLPGA, which are not inconsistent with this IRR shall be adopted. In case of variance, the stricter provision shall be applied.
9. The City/Municipal Fire Marshal having jurisdiction shall inspect LPG installations to determine if the provisions of this IRR are being complied with.

E. Fuel Gas Applications

In addition to the above cited provisions on LPG, the fire safety measures for fuel gas applications shall comply with the applicable provisions of Chapter 11 of NFPA 58 "Liquefied Petroleum Gas Code", Philippine National Standards (PNS) No. PNS/DOE FS 3:2006 ICS 75.200 "Auto-LPG Dispensing Station"; Department of Energy (DOE) Circular No. DC2007-02-0002 "Providing for the Rules and Regulations Governing the Business of Supplying, Hauling, Storage, Handling, Marketing and Distribution of Liquefied Petroleum Gas (LPG) for Automotive Use" and applicable Department of Transportation and Communications (DOTC) Rules and Regulations, and Standards that cover the following:

1. Power units to drive automotive vehicles and trucks and to operate forklifts or other industrial equipment;
2. Portable engines, such as floor maintenance machines or portable electrical generators; and

3. Stationary engines, such as gas or electric turbines.

F. Fire Safety Clearance

A Fire Safety Clearance for the installation, storage, handling, sale, maintenance and transportation of Liquefied Petroleum Gas (LPG) shall be obtained from City/Municipal Fire Marshal having jurisdiction.

SECTION 10.3.5.3.4 COMPRESSED NATURAL GAS AS VEHICLE FUEL

This Section shall govern the storage, installation, operation, repair and maintenance, fire protection and other safety measures of compressed natural gas (CNG) engine fuel systems on vehicles of all types, including the following:

- Original equipment manufacturers (OEM);
- Vehicle converters; and
- Vehicle fuelling (dispensing) systems.

A. General CNG and Equipment Qualifications

1. Containers shall be for CNG service, and its repair or alteration in accordance with the ASME Boiler and Pressure Vessel Code and/or manufacturer's instruction. It shall be fabricated either of steel, aluminium, or composite materials, designed and permanently marked "CNG" by the manufacturer.
2. Each container or cylinder shall be fitted with one or more pressure relief devices of approved type and whose discharge flow rate shall not be reduced below that required for the capacity of the container upon which the device is installed.
3. Pressure relief devices shall be appropriately installed, located, protected, repaired, adjusted, and tested in accordance with the aforementioned ASME Code and manufacturer's instruction.
4. A pressure gauge, if provided, shall be capable of reading at least 1.2 times the system design pressure. Such gauge shall have an opening not to exceed one and four-tenths millimeters (1.4 mm) (No. 54 drill size) at the inlet connection.
5. A pressure regulator inlet and each chamber service pressure shall be with a pressure safety factor of at least 4. Its low-pressure chambers shall provide for overpressure relief or shall be able to withstand the service pressure of the upstream pressure chamber.
6. Pipes, tubing, fittings, gaskets, and packing material for fuel lines shall be compatible with the fuel under the service conditions. Such shall be capable of withstanding a hydrostatic test of at least four times the

rated service pressure without structural failure. The fabrication and testing shall be in accordance with ANSI/ASME B31.3, "Chemical Plant and Petroleum Refinery Piping". Piping components such as strainers, snubbers, and expansion joints shall be permanently marked by the manufacturer to indicate the service ratings.

7. Valves or shutoff valves shall have a rated service pressure not less than the rated service pressure of the entire system and shall be capable of withstanding a hydrostatic test of at least four times the rated service pressure without rupture. Leakage shall not occur at not less than one-and-a-half (1.5) times the rated service pressure, using dry air as the test medium. The valve body shall bear the permanent marking of "CNG", service ratings and ASTM or internationally accepted standards adopted by the manufacturer.
8. Hose, metallic hose, flexible metal hose, tubing, and their connections shall be resistant to corrosion and exposure to natural gas and can resist the most severe pressures and temperatures expected under normal operating conditions with a burst pressure of at least four (4) times the service pressure. Hose and metallic hose shall be distinctly marked by the manufacturer indicating its name or trademark, applicable service identifier, and design pressure.
9. Vehicle fuelling connection devices shall be of the approved type complying with applicable ASME Code and other internationally accepted standards. The use of adapters shall be prohibited.

B. Engine Fuel Systems

1. Storage and Installation

- a. The storage, installation, inspection, testing, repair and maintenance, and safety measures of CNG fuel supply systems for vehicular internal combustion engines shall comply with NFPA 52, *Vehicular Fuel Systems Code*, manufacturer's instructions and other internationally accepted standards.
- b. Aluminum or copper pipe, tubing, or fittings shall not be used between the fuel container and the first-stage pressure regulator.
- c. Fuel supply containers its piping, fittings, and valves located within, below or above the driver or passenger compartment shall be protected with a means to prevent damage that can occur due to road hazards, loading, unloading, direct sunlight, exhaust heat, and vehicle use including accidental cargo leakage.
- d. No portion of a fuel supply container or container appurtenance shall be located ahead of the front axle or behind the point of attachment of the rear bumper to the vehicle. Container valves

shall be protected from physical damage using the vehicle structure, valve protectors, or a suitable metal shield. The cylinder shall also be protected from accidental contact with overhead electrical wiring by metallic or non-metallic covers.

- e. Containers that are installed behind a rear axle of a CNG vehicle shall be installed transversely.

Exception: Containers shall be permitted to be installed in other orientations where the container valve and fittings are located at the end of the container most protected from a source of impact.

- f. Each container rack shall be secured to the vehicle body, bed, or frame to prevent damage from road hazards, slippage, loosening, or rotation using a method capable of withstanding a static force in the six principal directions of eight times the weight of a fully pressurized container(s). The container weight shall not be supported by outlet valves, manifolds, or other fuel connections.
- g. Each fuel supply container in the rack shall be secured to its cradle in such a manner that it is capable of withstanding a static force applied in the six principal directions of eight times the weight of the fully pressurized container with a maximum displacement of thirteen millimeters (13 mm).
- h. Fuel supply containers located less than two hundred millimeters (200 mm) from the exhaust system shall be shielded against direct heat.
- i. The mounting system shall minimize fretting corrosion between the container and the mounting system. A resilient gasket that does not retain water shall be installed between metal clamping bands and their supports and container. The resilient gasket shall provide insulation to protect clamping bands from galvanic corrosion in contact with carbon fiber containers.
- j. Containers located in a vehicle compartment capable of accumulating natural gas shall install a pressure relief device vented to the outside through a metallic tube or hose and shall be maintained to prevent it from being blocked by debris.
- k. The minimum clearance from the road to a container, its housing, or fittings, whichever is lowest where the container is installed below the frame and between the axles of a CNG vehicle, with the vehicle loaded to its gross weight rating, shall be in accordance with the **Table 27**.

Table 27: CONTAINER (AND CONTAINER HOUSING AND FITTING) ROAD CLEARANCE

Vehicle Wheel Base	Minimum Road Clearance
3230 mm	180 mm
> 3230 mm	230 mm

- I. The venting system for the discharge of pressure relief devices (pressure relief device channels) shall be constructed of metallic tubing with threaded compression, or flare fittings and shall be secured at the outer end. It shall not exit into a wheel well nor restrict the operation of a container pressure relief device or pressure relief device channel. It shall also be protected by caps, covers, or other means to keep water, dirt, and insects from collecting in the lines, but shall not restrict the flow of gas.
- m. Fuel lines shall be mounted, braced, and supported to minimize vibration and shall be protected against damage, corrosion, or breakage due to strain or wear. A fuel line shall be installed, supported, protected, and secured in such a manner as to minimize the possibility of damage, corrosion, or breakage due to expansion, contraction, vibration, strains, or wear and to preclude any loosening while in operation. Where a fuel supply container is located on a trailer, the fuel supply line shall contain an emergency breakaway device designed to retain CNG on both sides of the breakaway point.
- n. Every cylinder shall be equipped with either a manual valve or a normally closed, remotely actuated shutoff valve connected directly to the cylinder. Remotely actuated valves shall be equipped to bleed the cylinder manually. In addition, a shutoff valve shall be installed that allows isolation of the container(s) from the remainder of the fuel system.
- o. A valve that automatically prevents the flow of gaseous fuel to the engine when the engine is not running, even if the ignition is switched on, shall be provided in the system. Where multiple fuel systems are installed on the vehicle, automatic valves shall be provided, as necessary, to shut off the fuel system not being used.
- p. The fuel system shall be equipped with a backflow check valve that prevents the return flow of gas from the container(s) to the filling connection.
- q. A pressure gauge located inside the driver or passenger compartment shall be installed in such a manner that no gas flows through the gauge in the event of failure.

- r. An automatic pressure reducing regulator(s) shall be installed to reduce the fuel container pressure to a level consistent with the service pressure required by the gas-air mixer and provided with support so that their weight is not placed on the gas lines, as well as means to prevent malfunctioning due to refrigeration effects.
- s. The fueling connection receptacle shall be mounted to withstand the breakaway force not greater than sixty-eight kilograms (68 kg) when applied in any horizontal direction. The receptacle shall be installed in accordance with the manufacturer's instructions. The clearance around the fueling connection shall be free of interference that prevents the connection of the fueling nozzle.

2. Maintenance, Fire Protection and Other Safety Measures

a. Safety Testing, Maintenance and Repair

- i. The complete assembly shall be leak-tested using natural gas or non-flammable gas. Before use, every connection shall be verified leak-free with a non-corrosive leak detector solution or a leak detector instrument after the equipment is connected and pressurized to its service pressure. The testing shall be done under adequately ventilated conditions.
- ii. Where a vehicle is involved in an accident or fire causing damage to the CNG container, or if the container is subjected to a pressure greater than one hundred twenty five percent (125%) of service pressure, the CNG container shall be replaced or removed, inspected, and retested in accordance with the document under which it was originally manufactured before being returned to service.
- iii. Where a vehicle is involved in an accident or fire causing damage to any part of the CNG fuel system, the system shall be repaired and retested before being returned to service.
- iv. All containers, container appurtenances, piping systems, venting systems, and other components shall be maintained in a safe condition. Damaged fuel lines shall be replaced and not be repaired. It shall be verified that the container retest date or expiration date is current.
- v. All pressure relief devices on the cylinder shall be maintained in accordance with the manufacturer's instructions and only qualified personnel shall be permitted to service pressure relief devices.
- vi. Fire and other safety measures during vehicle maintenance:

- vi.a. Close the quarter turn fuel delivery valve nearest the engine unless engine operation is required.
- vi.b. Prohibit torches, welding, or grinding equipment on or near high-pressure fuel lines and containers.
- vi.c. Prevent damage to containers, including actions such as dropping, dragging, or rolling of the container.
- vi.d. Prevent exposure of composite wrapped containers to strong chemicals such as battery acid or metal cleaning solvents.
- vi.e. Prevent hoists or jacks from coming into direct contact with containers.
- vi.f. Provision of at least a stand-by 20B:C type of fire extinguisher readily available to provide first aid fire protection.

vii. A regulated and safe discharge of CNG from vehicle containers shall comply with the following:

- vii.a. The venting or depressurization of a compressed natural gas container shall be performed only by trained personnel using written procedures. The gas to be removed from the container shall be discharged into a closed transfer system and shall be vented by an approved atmospheric venting method.
- vii.b. Personnel performing container depressurization shall:
 - Use grounding to prevent static electrical charge build-up;
 - Limit the rate of gas release from plastic-lined containers to a value not greater than that specified by the container manufacturer; and
 - Restrain containers during depressurization to prevent container movement.

viii. Direct gas venting shall be done through a vent tube that will divert the gas flow to the atmosphere. The vent tube shall have a gas-tight connection to the container prior to venting, and all components shall be properly grounded. The vent tube shall be constructed of Schedule 80 pipe of at least five centimeter (5 cm) diameter. The vent tube shall not be provided with any feature that would limit or obstruct gas flow.

b. Electrical Safety

All wiring installations shall be secured and protected from abrasion and corrosion to the same standard as the original wiring on the vehicle. In addition, it shall be sized and fuse-protected.

c. Markings and Safety Labelling

- i. Fuel-carrying components shall be labelled or stamped with the following:
 - i.a. The manufacturer's name or symbol;
 - i.b. The model designation;
 - i.c. The design service pressure;
 - i.d. The direction of fuel flow where necessary for correct installation; and
 - i.e. The capacity or electrical rating, as applicable.
- ii. Where a manual valve is used, the valve location shall be indicated with the words "**MANUAL SHUTOFF VALVE.**" A weather-resistant decal or label with red, blue, or black letters on a white or silver reflective background shall be used.
- iii. A vehicle equipped with a CNG fuel system shall bear the following durable labels.
 - iii.a. A label readily visible and located in the engine compartment shall include the following:
 - Identification as a CNG-fueled vehicle;
 - System service pressure;
 - Installer's name or company;
 - Container retest date(s) or expiration date; and
 - Total container water volume in liters (gallons).
 - iii.b. A label located at the fuelling connection receptacle shall include the following:
 - Identification as a CNG-fuelled vehicle;
 - System working pressure; and
 - Container retest date(s) or expiration date.

Exception: If both labels are located in one of the above areas, the labels shall be permitted to be combined into a single label.

- iv. Each vehicle shall be identified with a weather-resistant, diamond-shaped label located on an exterior vertical surface or near-vertical surface on the lower right rear of the vehicle (e.g., on the trunk lid of a vehicle so equipped, but not on the bumper of any vehicle) inboard from any other markings. The label shall be a minimum of one hundred twenty millimeters (120 mm) in length and eighty-three (83 mm) in height. The marking shall consist of a border and the letters "CNG", twenty five millimetres (25 mm) minimum height centered in the diamond, of silver or white reflective luminous material on a blue background.

C. CNG Compression, Storage, and Dispensing Systems

1. Compression equipment shall be designed for use with CNG and for the pressures and temperatures to which it can be subjected under normal operating conditions. It shall have pressure relief devices that limit each stage pressure to the maximum allowable service pressure for the compression cylinder and piping associated with that stage of compression. Compression equipment shall incorporate a means to minimize liquid carryover to the storage system.
2. Unattended CNG compression equipment shall be equipped with a high discharge and a low suction pressure automatic shutdown control.
3. Engine-driven compressor installations shall conform, where applicable, to NFPA 37, *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines*.
4. Control devices shall be installed so that internal or external icing or hydrate formation does not cause vehicle or fueling station malfunction.
5. The fueling connection shall prevent the escape of gas where the connector is not properly engaged or becomes separated. Fueling nozzles shall be listed in accordance with ANSI/IAS NGV1, *Standard for Compressed Natural Gas Vehicle (NGV) Fueling Connection Devices*.

6. Locations

a. Outdoors

- i. A facility in which CNG compression, storage, and dispensing equipment are sheltered by an enclosure that is constructed of

non-combustible or limited-combustible materials and that has at least one side predominantly open and a roof designed for ventilation and dispersal of escaped gas shall be considered located outdoors.

- ii. Compression, storage, and dispensing equipment located outdoors shall be:
 - i.a. Above ground and not be beneath electric power lines, located at least three meters (3.0 m) from the nearest important building or line of adjoining property that a building can be built upon or from any source of ignition;
 - i.b. More than three meters (3.0 m) from the nearest public street or sidewalk line and at least fifteen meters (15 m) from the nearest rail of any railroad main track;
 - i.c. Provided with a clear space of at least one meter (1) m for access to all valves and fittings of multiple groups of containers;
 - i.d. Provided with a minimum separation of three meters (3.0 m) from readily ignitable material of any stationary container;
 - i.e. Provided with a minimum separation of six hundred ten centimeters (610 cm) between containers and aboveground tanks containing flammable or combustible liquids.
- iii. During outdoor fueling operations, the point where the fueling connection is made shall be located at least three meters (3.0 m) from any important building, mobile home, public sidewalk, highway, street, or road and at least one meter (1 m) from storage containers
- iv. A lesser distance shall be from buildings or walls constructed of concrete or masonry materials or of other material having a fire resistance rating of at least two (2) hours, but at least three meters (3.0 m) from any building openings.

b. Indoors

- i. Compression, dispensing equipment, and storage containers connected for use shall be permitted to be located inside of buildings reserved exclusively for these purposes or in rooms within or attached to buildings in accordance hereof.

- ii. Storage shall be limited to not more than two hundred eighty three cubic meters (283 m^3) of natural gas in each building or room.

Exception: CNG stored in vehicle-mounted fuel supply containers.

- iii. Deflagration (explosion) venting shall be provided in exterior walls or roof only.
- iv. Rooms within or attached to other buildings shall be constructed of non-combustible or limited-combustible materials. Interior walls or partitions shall be continuous from floor to ceiling, shall be securely anchored, and shall have a fire resistance rating of at least two (2) hours. At least one wall shall be an exterior wall.
- v. Indoor locations shall be ventilated utilizing air supply inlets and exhaust outlets arranged to provide uniform air movement to the extent practical. Inlets shall be uniformly arranged on exterior walls near floor level. Outlets shall be located at the high point of the room in exterior walls or the roof. A ventilation system for a room within or attached to another building shall be separate from any ventilation system for the other building.
- vi. Ventilation shall be by a continuous mechanical ventilation system or by a mechanical ventilation system activated by a continuously monitoring natural gas detection system where a gas concentration of not more than one-fifth (1/5) of the lower flammable limit is present. The ventilation rate shall be at least $1\text{ m}^3/\text{min}\cdot 12\text{ m}^3$ of room volume. In either case, the system shall shut down the fueling system in the event of failure of the ventilation system. Reactivation of the fueling system shall be by manual restart and shall be conducted by trained personnel.
- vii. Where installed, a gas detection system shall be equipped to sound an alarm and visually indicate when a maximum of one-fifth (1/5) of the lower flammable limit is reached.
- viii. Buildings and rooms used for compression, storage, and dispensing shall be classified in accordance with **Table 28**. No electrical sources of ignition, other than electrical installations as permitted by the preceding provision, shall be permitted.
- ix. Pressure relief devices on storage systems shall have pressure relief device channels to convey escaping gas to the outdoors and then upward to a safe area to prevent impinging on

buildings, other equipment, or areas open to the public (e.g., sidewalks).

- x. Access doors shall have warning signs with the words "**WARNING—NO SMOKING—FLAMMABLE GAS**". Such wording shall be in plainly legible, bright red letters on a white background with letters not less than twenty-five millimetres (25 mm) in height.
- xi. Fast-fill fueling indoors is permitted where storage and compression equipment is located outdoors complying the aforementioned indoor requirements. In addition, an emergency manual shutdown device shall be installed as prescribed hereto and a gas detection system equipped to sound an alarm and visually indicate when a maximum of one-fifth (1/5) of the lower flammable limit is reached shall be installed. The detector shall shut down the compressor and stop the flow of gas into the structure.

7. Installation of Containers and Container Appurtenances (Other Than Pressure Relief Devices)

- a. Storage containers shall be installed above ground on stable, noncombustible foundations or in vaults with ventilation and drainage. Horizontal containers shall have no more than two points of support longitudinally. Where flooding can occur, each container shall be securely anchored to prevent floating.
- b. Containers shall be provided with corrosion protection in accordance with the manufacturer's instructions. Horizontally installed containers shall not be in direct contact with each other.
- c. Means shall be provided to prevent the flow or accumulation of flammable or combustible liquids under containers, such as by grading, pads, or diversion curbs.

8. Installation of Pressure Relief Devices

- a. Pressure relief valves shall discharge to a safe area and escaping gas shall not impinge on buildings, other equipment, or areas subject to occupancy.
- b. Pressure relief valves on pressure vessels shall be in vertical positions and fitted with rain caps.
- c. An overpressure protection device, other than a rupture disc, shall be installed in the fueling transfer system to prevent overpressure in the vehicle. The set pressure of the device shall not exceed one hundred twenty five percent (125%) of the service pressure of the fueling nozzle it supplies.

9. Installation of Pressure Regulators

Regulators shall be installed so that their operation is not affected by weather, mud, insects, or debris.

10. Installation of Pressure Gauges

Gauges shall be installed to indicate compression discharge pressure, storage pressure, and fuel supply container fill pressure.

11. Installation of Piping and Hoses

- a. Piping and hose shall be run as directly as practical and with adequate provisions for expansion, contraction, jarring, vibration, and settling. Exterior piping shall be either buried or installed above ground and shall be supported and protected against mechanical damage. Underground piping shall be buried not less than four hundred sixty millimetres (460 mm) below the surface of the ground unless otherwise protected from damage by movement of the ground. Underground and aboveground piping shall be protected from corrosion in compliance with recognized practices. Threaded pipe and fittings shall not be used under ground.
- b. Manifolds connecting fuel containers shall be fabricated to minimize vibration and shall be installed in a protected location, or shielded to prevent damage from unsecured objects.
- c. Piping installation, including its fittings and methods of jointing shall comply with the applicable Plumbing Code of Practice for CNG Vehicles.
- d. Natural gas shall be vented only to a safe point of discharge. A vent pipe or stack shall have the open end protected to prevent entrance of rain, and solid material. Vertical vent pipes and stacks shall have provisions for drainage.
- e. The use of hose in an installation shall be limited to the following:
 - i. A vehicle fueling hose;
 - ii. An inlet connection to compression equipment; or
 - iii. A section of metallic hose not exceeding nine hundred ten millimeters (910 mm) in length in a pipeline to provide flexibility where necessary. Each section shall be so installed that it is protected against mechanical damage and is readily visible for inspection. The manufacturer's identification shall be retained in each section.
- f. At public fueling stations, provision shall be provided to recycle gas used for calibration and testing.

12. Testing

- a. Piping, tubing and hose, and hose assemblies shall be leak tested after assembly to prove them free from leaks at a pressure equal to at least the normal service pressure of that portion of the system.
- b. Pressure relief valves shall be tested at least every five (5) years.

13. Installation of Emergency Shutdown Equipment

- a. A manually operated container valve shall be provided for each DOT or TC storage cylinder. Each group of ASME storage vessels up to a maximum combined capacity of two hundred eighty three cubic meters (283 m^3) shall be provided with a manually operated shutoff valve.
- b. The fill line on a storage container shall be equipped with a backflow check valve to prevent discharge of natural gas from the container in case of the rupture of the line, hose, or fittings.
- c. A manually operated shutoff valve shall be installed in a manifold as close to a container or group of containers as practical.
- d. Gas piping from an outdoor compressor or storage system into a building shall be provided with shutoff valves located outside the building.
- e. An emergency manual shutdown device shall be provided at the dispensing area and at a location remote from the dispensing area. This device, when activated, shall shut off the power supply and gas supply to the compressor and the dispenser.
- f. A breakaway device shall be installed at every dispensing point. Such device shall be arranged to separate using a force not greater than sixty-eight kilograms (68 kg) when applied in any horizontal direction.
- g. Control circuits shall be arranged so that, when an emergency shutdown device is activated or electric power is cut off, systems that shut down shall remain down until manually activated or reset after a safe condition is restored.
- h. Each line between a gas storage facility and a dispenser at a fast-fill station shall have a valve that closes when one of the following occurs:
 - i. The power supply to the dispenser is cut off; or
 - ii. Any emergency shutdown device at the refueling station is activated.

- i. A fast-closing, "quarter turn" manual shutoff valve shall be provided at a fast-fill station upstream of the breakaway device, readily accessible to the person dispensing natural gas.
- j. A self-closing valve shall be provided on the inlet of the compressor that shuts off the gas supply to the compressor.

14. Installation of Electrical Equipment

Fixed electrical equipment and wiring, within areas specified in **Table 28** below, shall comply with same table and shall be installed in accordance with NFPA 70, *National Electrical Code®*.

Electrical equipment on internal combustion engines shall be installed in accordance with NFPA 37, *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines*.

Table 28: ELECTRICAL INSTALLATIONS IN CNG SERVICE STATIONS

Location	Division or Zone	Extent of Classified Area
Containers (other than mounted fuel supply containers)	2	Within 3 m of container
Area containing compression and ancillary equipment		
Outdoors	2	Up to 4.6 m from equipment
Indoors	2	Up to 4.6 m from equipment
Dispensing equipment		
Outdoors	1	Inside the dispenser enclosure
Outdoors	2	From 0 to 1.5 m from the dispenser
Indoors	1	Inside the dispenser enclosure
Indoors	2	Entire room, with adequate ventilation
Outdoors		
Discharge from relief valves or vents	1	1.5 m in all directions from the point source
	2	Beyond 1.5 m but within 4.6 m in all directions from point of discharge
Valves, flanges or screwed fittings	None	Unclassified
Discharge from relief valves within 15 degrees of the line of discharge	1	4.6 m

Exception: Listed dispensers shall be permitted to be installed using classified areas in accordance with the terms of the listing.

15. Stray or Impressed Currents and Bonding

- a. Where stray or impressed currents are present, ignition shall be taken in accordance with API RP 2003, *Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents*.
- b. Static protection shall not be required where CNG is loaded or unloaded by conductive or nonconductive hose, flexible metallic tubing, or pipe connections where both halves of the metallic couplings are in contact.
- c. A cylinder shall not be charged in excess of the design pressure at the normal temperature for that cylinder as per manufacturer's instructions.
- d. A fuel supply container shall not have a settled pressure above the service pressure that is stamped on the container and displayed on a label near the filling connection, corrected for the ambient temperature at the time of filling.
- e. CNG dispensing systems shall be equipped to stop fuel flow automatically when a fuel supply container reaches the temperature-corrected fill pressure. Where an overpressure incident that results in operation of the overpressure protection system occurs, the dispenser pressure control system shall be examined and certified by a qualified technician prior to being returned to service.
- f. The transfer of CNG into a fuel supply container shall be performed in accordance with instructions posted at the dispensing station.
- g. Where CNG is being transferred to or from a motor vehicle, the engine shall be turned off.
- h. During the transfer of CNG to or from cargo vehicles, the hand or emergency brake of the vehicle shall be set, and chock blocks shall be used to prevent rolling of the vehicle.
- i. Transfer systems shall be capable of depressurizing to facilitate disconnection. Bleed connections shall lead to a safe point of discharge.
- j. Sources of ignition shall not be permitted within three meters (3.0 m) of any filling connection during a transfer operation.
- k. A warning sign with the words "**STOP MOTOR, NO SMOKING, FLAMMABLE GAS**" shall be posted at dispensing station and compressor areas. The location of signs shall be determined by

local conditions, but the lettering shall be large enough to be visible and legible from each point of transfer.

16. Fire Protection

A portable fire extinguisher having a rating of not less than 20-B:C shall be provided at the dispensing area.

17. Maintenance

- a. Containers and their appurtenances, piping systems, compression equipment, controls, and devices shall be maintained in proper operating condition.
- b. After the original installation, vehicle-fueling hoses shall be examined visually at such intervals as are necessary to ensure that they are safe for use. Hose shall be tested for leaks per manufacturer's requirements, but at least annually, and any unsafe leakage shall be reason for rejection.
- c. While in transit, fueling hose and flexible metal hose on a cargo vehicle to be used in a transfer operation, including their connections, shall be depressurized and protected from wear and injury.
- d. Pressure relief valves shall be maintained in proper operating condition.

18. Vehicle Fueling Appliances in Nonresidential Occupancies

- a. Vehicle fueling appliances (VFAs) shall be of the approved type and shall not exceed a gas flow of 10 scf/min (0.28 standard cubic meter/min).
- b. VFAs shall be permitted to be used to fill stationary containers at vehicle fueling locations.
- c. The installation of VFAs shall comply with the requirements of the provisions set forth for Residential Fueling Facility.
- d. VFAs shall not be installed within three meters (3.0 m) of any storage.

Exception: Storage in the vehicle fuel supply container

- e. Where installed indoors in public assembly and educational occupancies, a VFA shall be located in a portion of the occupancy where NFPA 101®, *Life Safety Code*®, or the local building code permits the installation of hazardous equipment.

D. Residential Fueling Facility

The capacity of a residential fueling facility (RFF) shall not exceed 0.14 standard cubic meter/min of natural gas. Storage of CNG shall be prohibited; however, CNG shall be permitted to be stored in the vehicle fuel supply container.

1. All equipment related to RFF installation shall be protected to minimize the possibility of physical damage and vandalism. This requirement shall be permitted to be met by the use of an enclosure for the compressor package, similar to that of a central air conditioner.
2. All equipment related to RFF installation shall be designed for the pressure, temperature, and service expected.
3. Vehicles shall be considered as unclassified electrically with respect to NFPA 70, National Electrical Code, Article 500.
4. Natural gas shall not be vented to the atmosphere under normal operation.
5. Unless specifically permitted by the installation instructions, multiple VFAs shall not be manifolded together on the discharge side.
6. Where more than one VFA are located in a common area, spacing between VFAs shall not be less than one meter (1 m) unless permitted by the installation instructions.

7. Installation

- a. CNG compression and dispensing shall be located and conducted outdoors wherever practical. However, where not practical (e.g., where inclement weather is common), compression and dispensing shall be permitted to be located indoors.
- b. All RFF equipment shall be installed in accordance with the equipment manufacturer's instructions.
- c. The RFF shall have a nameplate marked with minimum and maximum gas inlet pressure and flow rate, gas outlet maximum pressure, and electrical requirements.
- d. Indoor Installations
 - i. Where it is necessary to install the compression unit and refueling connections indoors, the compression unit shall be mounted or otherwise located such that the compression unit is vented outdoors.

ii. Where the RFF or the vehicle being fueled is located indoors, a gas detector set to operate at one-fifth the lower limit of flammability of natural gas shall be installed in the room. The detector shall be located within one hundred fifty millimeters (150 mm) of the ceiling or the highest point in the room. The detector shall stop the compressor and operate an audible or a visual alarm.

e. Outdoor Installations

The RFF shall be installed on a firm, noncombustible support to prevent undue stress on piping and conduit.

f. Installation of Pressure Relief Valves

Pressure relief valves shall have pressure relief device vents or vent lines to convey escaping gas to the outdoors and then upward to a safe area to prevent impinging on buildings, other equipment, or areas open to the public (e.g., sidewalks).

g. Installation of Pressure Gauges

For measurement and test purposes, pressure gauges shall be permitted to be installed but shall not be required.

h. Pressure Regulation

An RFF shall be equipped to stop fuel flow automatically when the container(s) reaches the temperature-corrected fill pressure.

i. Piping and Hose

i. All piping and hose from the outlet of the compressor shall be supplied as part of the RFF.

ii. All gas piping to the RFF shall be installed in accordance with NFPA 54, *National Fuel Gas Code*.

iii. The use of hose in an installation shall be restricted to the following:

i.a. A fueling hose that shall be limited to a maximum length of seven hundred sixty centimeters (760 cm) and shall be supported above the floor/ground level or otherwise protected from mechanical damage from abrasion and being driven over by a vehicle

- i.b. A maximum of one meter (1 m) in length where used to prevent abrasion damage resulting from vibration on the inlet or outlet, or both
- iv. Transfer systems shall be capable of depressurizing to facilitate disconnection. Bleed connections shall lead to a safe point of discharge.

j. Testing

All piping and tubing shall be tested after assembly to be proven free of leaks at a pressure equal to the maximum service pressure of that portion of the system.

k. Installation of Emergency Shutdown Equipment

- i. An RFF shall be equipped with emergency manual shutdown of the gas supply and electric power. The emergency electrical switch shall be at least one hundred fifty centimeters (150 cm) from the RFF and in view of the RFF.
- ii. Breakaway protection shall be provided in a manner so that, in the event of a pull away, natural gas would cease to flow.
- iii. A breakaway device shall be installed at every dispensing point. Such a device shall be so arranged as to separate using a force not greater than sixty-eight kilograms (68 kg) when applied in any horizontal direction.

l. Operation

- i. An RFF shall be operated in accordance with the manufacturer's instructions.
- ii. A fuel supply container shall not be charged in excess of its maximum allowable service pressure at normal temperature. DOT and TC containers shall be charged in accordance with DOT and TC regulations.
- iii. Where CNG is being transferred to a motor vehicle, the engine shall be stopped.

m. Maintenance and Inspection

- i. All RFF equipment shall be inspected and maintained in accordance with the manufacturer's instructions.
- ii. After installation, all hoses shall be examined visually as part of this inspection. Hoses that are kinked or worn shall be replaced.

- iii. All safety relief valves shall be maintained in proper operating condition in accordance with the manufacturer or supplier's recommendation.

SECTION 10.3.4.4 OTHER HAZARDOUS MATERIALS AND CHEMICALS

SECTION 10.3.4.4.1 SCOPE

This Division shall apply to the storage, handling, transport and protection of hazardous materials and chemicals not covered on Chapter 3 of this Rule.

SECTION 10.3.4.4.2 OXIDIZING MATERIALS

- A. Packaged oxidizing materials shall be stored in dry locations and separated from stored organic materials. Bulk oxidizing materials shall not be stored on or against wooden surfaces.
- B. Oxidizing materials shall be stored separately from flammable solids, combustible materials, hazardous chemicals, corrosive liquids and such other non-combustible materials.

SECTION 10.3.4.4.3 RADIOACTIVE MATERIALS

- A. Durable, clearly visible signs of warning of radiation dangers shall be placed at all entrances to areas or rooms where radioactive materials are used or stored. In addition, each container in which radioactive materials are used, stored, or transported shall bear a durable, clearly visible, appropriate warning sign. Such signs shall bear the three-bladed radiation symbol in magenta or purple on a yellow background in accordance with the Rules of the Philippine Atomic Energy Commission.
- B. Except for liquids, signs are not required for the storage of manufactured articles such as instruments or clock dials or electronic tubes or apparatus, of which radioactive materials are a component part, and luminous compounds, when securely packed in strong containers, provided the gamma radiation at any surface of the package is less than ten (10) milliroentgens in 24 hours.
- C. When not in use, radioactive materials shall be kept in adequately shielded fire-resistant containers of such design that the gamma radiation will not exceed 200 milliroentgens per hour or its equivalent at any point of readily accessible surface.
- D. The opinion of the Philippine Atomic Energy Commission shall be obtained in all cases of doubt as to the safety of radioactive materials. The Commission's ruling shall be final and non-appealable.

SECTION 10.3.4.4.4 POTENTIALLY EXPLOSIVE CHEMICALS

- A. Potentially explosive chemicals shall be stored away from all heat-producing appliances and electrical devices and shall be protected from external, heat, fire and explosion.
- B. Explosives and blasting agents shall not be stored in the same building or in close proximity to such materials except in accordance with this Code.
- C. Good housekeeping shall be maintained uncontaminated of broken or cracked bags, packages or other containers shall be transferred to new and clean container before storing.
- D. Other spilled materials and discarded containers shall be promptly gathered and destroyed in an approved manner.
- E. All electric bulbs shall be equipped with guards to prevent breakage.
- F. Open lights or flames and smoking shall be prohibited in or near storage areas.
- G. Internal combustion motor vehicles or lift trucks shall not be parked in the room or compartment where such chemicals are located.

SECTION 10.3.4.4.5 ORGANIC PEROXIDES

- A. A detached, well isolated, ventilated and un-heated storage building constructed with walls having a fire resistance rating of not less than two (2) hours, a non-combustible floor, and a light weight insulated roof shall be provided for the storage of twenty two kilograms (22 kg) or more of organic peroxides. If not adequately protected by a fast-acting deluge type automatic fire-fighting system, the storage building shall be located at the following minimum distances from flammable or combustible liquid, building or highway.

WEIGHT OF ORGANIC PEROXIDES (Kilograms)	DISTANCE (Meters)
22 to 45	23.00
45 to 227	30.00
227 to 445	38.00
445 to 1364	60.00
1363 to 2270	92.00

- B. The organic peroxides shall be stored in the original shipping containers.
- C. Care shall be taken to avoid rough handling or contamination of these chemicals.

D. Readily legible warning signs and placards as prescribed in Chapter 3 Division 2 of this Rule. Signs shall be prominently placed in the storage and processing areas.

SECTION 10.3.4.4.6 NITROMETHANE

- A. A suitable isolated outdoor storage area shall be provided for nitromethane.
- B. Hazardous processing shall not be permitted in the vicinity of this storage area.
- C. Nitromethane shall be stored in the drums in which it is received or in an underground tank with suitable corrosion protection and a minimum of sixty centimeters (60 cm) of earth over the tank or in barricaded tanks above-ground shall be provided. If the drum storage is not adequately protected by a fast-acting deluge automatic type fire-fighting system/the storage of nine hundred nine kilograms (909 kg.) or more shall be located at the following minimum distances from inhabited buildings.

WEIGHT (Kilograms)	APPROXIMATE NUMBER OF DRUMS	DISTANCE (meters)
Beginning of 908 kg	4	30
909 kg to 4546 kg	20	60
4547 kg to 9091 kg	40	90
9092 kg to 18,182 kg	80	120
18,183 kg to 36,364 kg	160	150

- D. Care shall be taken to avoid rough handling or contamination of this chemical.
- E. Readily legible warning signs and placards as prescribed in this Rule shall be prominently placed in the transport, storage and processing area.

SECTION 10.3.4.4.7 AMMONIUM NITRATE

- A. All flooring in storage and handling areas shall be of non-combustible material and shall be without drains, traps, pits or pockets into which any molten ammonium nitrate could flow and be confined in case of fire.
- B. Each storage pile of bags or other authorized packages and container of such materials shall not exceed three hundred sixty five centimeters (365 cm) in height, three hundred sixty five (365 cm) centimeters in width and nine meters and fifteen centimeters (9.15 cm) in length.
- C. Pile units shall be separated by a clear space of not less than ninety two centimeters (92 cm) in width from the top of piles, serving as cross aisles in the storage area which shall not be less than one hundred twenty centimeters (120 cm) in width.

- D. A clearance of not less than seventy six centimeters (76 cm) shall be maintained from building walls and partitions, and not less than ninety centimeters (90 cm) from ceilings of roof structural members with a minimum of forty five centimeters (45 cm) from sprinklers.
- E. Ammonium nitrate storage shall be separated by a space of nine meters (9m) or by tight non-combustible partition from storage of organic chemicals, corrosive liquids, compressed gases, flammable and combustible materials, or other contaminating substance such as sulfur, coal, flour, and metallic powders such as zinc, copper, and magnesium where storage of such materials is permitted with ammonium nitrate.
- F. Quantities of ammonium or ammonium nitrate fertilizers having no organic coating, in the form of crystals, flakes, grains or pills including fertilizers, dynamic grade, nitrous oxide grade and technical grade ammonium nitrate and ammonium nitrate phosphate (containing 60% of ammonium nitrate by weight) or more than fifty (50) metric tons of total weight, shall be stored in well-ventilated building of fire-resistive or noncombustible construction, or in a building of other type of construction equipped with an approved automatic sprinkler system.
- G. In populated areas, quantities of two thousand five hundred (2,500) tons or more shall be stored in well-ventilated buildings of one-hour fire-resistive or non-combustible construction equipped with an approved automatic sprinkler system. No combustible material or ammonium nitrate sensitizing contaminants shall be stored in this building.
- H. Storage of ammonium nitrate, coated or mixed with organic anti-caking materials, except compounded blasting agent shall not be permitted in populated and congested areas. Outside such areas, quantities of five hundred (500) metric tons or less may be stored in well-ventilated buildings of fire-resistive or non-combustible construction equipped with an approved automatic firefighting system.

SECTION 10.3.4.4.8 HIGHLY TOXIC MATERIALS

- A. Highly toxic materials shall be segregated from other chemicals and combustible and flammable substances in a room or compartment separated from other areas by walls and floor and ceiling assemblies having a fire-resistive rating of not less than one (1) hour.
- B. The storage room shall be provided with adequate drainage facilities and natural or chemical ventilation to the outside atmosphere.
- C. Readily legible warning signs and placards as prescribed in this Rule shall be prominently placed in the transport, storage and processing area.

SECTION 10.3.4.4.9 POISONOUS GASES

- A. Storage of poisonous gases shall be in rooms of at least one-hour fire-resistant construction and having natural or mechanical ventilation adequate to remove leaking gas. Such ventilation shall not discharge to a point where gases may endanger any person.
- B. Readily legible warning signs and placards as prescribed in this Rule shall be prominently placed in the transport, storage and processing area.

SECTION 10.3.4.4.10 CORROSIVE LIQUIDS

- A. Satisfactory provision shall be made for containing and neutralizing or safely flushing away leakage of corrosive liquids which may occur during storage or handling.
- B. Readily legible warning signs and placards as prescribed in this Rule shall be prominently placed in the transport, storage and processing area.

SECTION 10.3.4.4.11 STORAGE CABINETS FOR HAZARDOUS MATERIALS

- A. Cabinets for the storage of hazardous materials shall be approved and substantially constructed of one-eighth (1/8) centimeters thick sheet iron or a minimum of two hundred fifty four millimeters (254 mm) plywood or equivalent.
- B. Doors shall be self-closing and self-latching.
- C. Cabinets shall be painted with luminescent type paint and shall be conspicuously labeled in red letters: "Hazardous - Keep Fire Away."

SECTION 10.3.4.4.12 DESIGNATION OF CARGO

- A. No person shall operate any tank vehicle transporting any corrosive cryogenic, hypergolic, or phyrophoric materials unless at all time of such transportation there is displayed upon each side and the rear of the tank vehicle a sign in letter not less than seven hundred sixty-two millimeters (762 mm) in height upon a background of sharply contrasting color, which shall specifically designate the cargo.
- B. Readily legible warning signs and placards as prescribed in this Rule shall be prominently placed in the transport, storage and processing areas.

SECTION 10.3.4.4.13 HAZARDOUS INSULATOR/CUSHIONING MATERIALS

- A. The storage areas for plastic-based, fire-supporting, fire-conductive, smoke generating, or toxic gas producing materials that are used as insulators or cushioning material for crates, boxes, walls, air conditioning

ducts, beds, chairs, and the like shall be provided with automatic fire extinguishing systems of an approved type.

SECTION 10.3.4.4.14 FIRE PROTECTION

All hazardous materials enumerated in this Chapter shall be protected by approved supervised sprinkler system and other appropriate fire protection appliances.

CHAPTER 4. FIRE SAFETY FOR HAZARDOUS OPERATIONS

DIVISION 1. SCOPE

A. This Chapter shall govern the Fire Safety Measures for the following Hazardous Operations:

1. Salvage Yards;
2. Bowling Alleys Resurfacing and Refinishing;
3. Dust Producing Machines;
4. Explosives, Ammunitions and Blasting Agents;
5. Fire Works;
6. Application of Flammable Finishes;
7. Ripening Processes;
8. Fumigation and Insecticidal Fogging;
9. Repair Garages;
10. Lumber Yards, Wood Processing and Woodworking Facilities;
11. Mechanical Refrigeration;
12. Motion Picture Projection;
13. Oil Burning Equipment;
14. Organic Coatings;
15. Industrial Ovens;
16. Hotworks Operations; and
17. Safeguarding Building Construction, Demolition and Alteration Operations

DIVISION 2. SALVAGE YARDS

SECTION 10.4.2.1 GENERAL REQUIREMENTS

A. Salvage yards shall be operated and maintained with the following requirements:

1. No salvage yard shall be so located as to seriously expose adjacent properties to fire. Serious exposure shall include situations where materials are stored or operations performed within four and a half meters (4.5 m) of an adjacent private property line.
2. The entire premises devoted to such yard or plant shall be enclosed with a chain-linked fence not less than two and a half meters (2.5 m) in height, with two (2) gates of four and a half meters (4.5 m) width for fire department access.
3. No roof of any building located in a salvage yard shall be used for storage. This applies to all buildings on a property where salvage work is performed or waste materials are handled, including those used for storage, vehicle shelters, administration and sales.
4. No motor vehicles, or any part thereof, junk, or other waste materials, shall be stored, displayed or kept in such a manner as to unnecessarily hinder or endanger fire fighting operations. Aisles or passageways of four and a half meters (4.5 m) wide shall be provided to permit access for firefighting equipment and personnel.

SECTION 10.4.2.2 FIRE SAFETY CLEARANCE REQUIRED FOR HOTWORK OPERATIONS

No welding and cutting operations in salvage yards shall be conducted without a fire safety clearance issued by the City/Municipal Fire Marshal having jurisdiction for hotworks operations.

SECTION 10.4.2.3 CONSTRUCTION

- A. Vertical openings in such building shall be enclosed with approved automatic self-closing fire doors in accordance with Section 10.2.5.3 of this IRR.
- B. Picking shall be done in rooms separated from storage rooms or other occupancies by fire resistive walls and doors having a fire resistance of not less than one (1) hour. Picking rooms shall be provided with exhaust systems to adequately and safely remove dust and dirt.

SECTION 10.4.2.4 OPERATION

- A. The storage and handling of flammable and combustible materials shall be in accordance with Division 4, Chapter 3, Rule 10 of this IRR.
- B. Welding and cutting operations shall conform to the provisions of Division 17 of this Chapter.

SECTION 10.4.2.5 PROTECTION AND MAINTENANCE

- A. In no case shall smoking, or open flame be permitted in any area where combustible fibers or other combustible waste materials are stored or handled. "NO SMOKING" signs shall be provided in accordance with Division 3, Chapter 5, Rule 10 of this IRR.
- B. The burning of wrecked or discarded motor vehicles or of junks, or of any waste materials shall be done only in locations and in a manner approved or prescribed for such purpose by the City/Municipal Fire Marshal having jurisdiction.

DIVISION 3. BOWLING ALLEYS RESURFACING AND REFINISHING

SECTION 10.4.3.1 GENERAL

Bowling alleys shall conform to applicable requirements of this IRR, as well as the provisions of this Division.

SECTION 10.4.3.2 FIRE SAFETY CLEARANCE REQUIRED

The operator/owner of a bowling establishment shall secure a fire safety clearance from the City/Municipal Fire Marshal having jurisdiction, before performing any refinishing and alley resurfacing operations involving the use of flammable liquids or materials on the premises.

SECTION 10.4.3.3 CONSTRUCTION

Pin finishes involving the application of flammable or combustible finishes, or sanding or buffing operations if done within a building, shall be done only in a fire resistive room having a fire resistance rating of two (2) hours.

SECTION 10.4.3.4 OPERATION

- A. Resurfacing and refinishing operations shall not be carried on while the establishment is open for business.
- B. Proper ventilation shall be provided. Heating, ventilating, or cooling systems employing recirculation of air shall not be operated during resurfacing and refinishing operations or within one (1) hour following the application of flammable finishes.

C. All electric motors or other equipment in the area, which is a potential source of ignition, shall be shut down and all smoking and use of open flames shall be prohibited during the application of flammable finishes and for one (1) hour thereafter.

SECTION 10.4.3.5 PROTECTION AND MAINTENANCE

- A. Sanding and buffing machines shall be provided with approved equipment for collecting dust during such operations. Contents shall be removed daily and disposed of safely.
- B. All power tools shall be effectively grounded.
- C. Storage of flammable or combustible liquids in any room shall not exceed a combined aggregate of two hundred twenty-five liters (225l), and it shall be in flammable liquid storage cabinet or in approved safety containers not exceeding nineteen liters (19l) individual capacity. An approved metal waste bin with a self-closing cover shall be provided for all waste rags and materials with the contents to be removed daily. Smoking shall be prohibited at all times in pin refinishing rooms.

DIVISION 4. DUST PRODUCING MACHINES

SECTION 10.4.4.1 FIRE SAFETY CLEARANCE REQUIRED

No person shall operate any grain elevator, flour, starch or feed mill, saw mill, or plant pulverizing aluminum, coal, cocoa, magnesium, spices, or other material producing dust without a fire safety clearance issued by the City/Municipal Fire Marshal having jurisdiction.

SECTION 10.4.4.2 CONSTRUCTION

- A. Approved magnetic or pneumatic separators shall be installed ahead of all shelters, crackers, crushers, grinding machines, pulverizers and similar machines in which the entrance of metallic or other foreign materials may cause sparks to be generated.
- B. Suitable dust collecting equipment shall be installed and accumulation of dust shall be kept at a minimum in the interior of the buildings.

SECTION 10.4.4.3 OPERATION

Properly designed and located vents equipped with explosion proof exhaust fans which will relieve the pressure resulting from dust accumulation or an explosion and prevent or reduce damage to buildings or equipment, shall be required in all buildings where flammable or explosive dusts are manufactured, processed or generated. The design of such equipment shall be in accordance with internationally accepted standards or NFPA 68, "Explosion Venting."

SECTION 10.4.4.4 PROTECTION AND MAINTENANCE

- A. All dust-producing or dust-agitating machinery such as grinding mills and separators, and all elevators, elevator legs, spouts, hopper and other conveyors shall be provided with casing or enclosures maintained as nearly dust-tight as possible
- B. All machinery and metal parts of the crushing, drying, pulverizing and conveying systems shall be provided with grounding system in accordance with the Philippine Electrical Code.
- C. Smoking and the carrying of matches, the use of heating or other devices employing open flames, or use of any spark-producing equipment is prohibited in areas containing dust-producing or dust-agitating operators. All wiring and electrical equipment of artificial lighting installed in such areas shall be in accordance with the provisions of the Philippine Electrical Code.
- D. Static electricity shall be removed from all machinery and other component parts by permanent grounds and/or bonds. The design of such equipment shall be in accordance with internationally accepted standards or NFPA 77, "Static Electricity."

DIVISION 5. EXPLOSIVES, AMMUNITION AND BLASTING AGENTS

SECTION 10.4.5.1 APPLICATION

- A. This Division shall not apply to:
 1. Explosives, ammunition and blasting agents used by the Armed Forces of the Philippines (AFP);
 2. Transportation and use of explosives, ammunition, or blasting agents by the Bureau of Mines, the National Bureau of Investigation (NBI) and the Philippine National Police (PNP) acting in their official capacity.

SECTION 10.4.5.2 FIRE SAFETY INSPECTION CERTIFICATE (FSIC) REQUIRED

No person shall manufacture, store, handle and/or use any blasting agents, explosives and special and industrial explosive materials, blasting caps, black powder, liquid nitro-glycerin, dynamite, nitro cellulose, fulminates of any kind, and plastic explosives containing ammonium salt or chlorate, without securing a Fire Safety Inspection Certificate (FSIC) from the City/Municipal Fire Marshal having jurisdiction, which is a pre-requisite for the granting of manufacturer's, dealer's, purchaser's, foreman's license and permit to unload issued by the PNP in accordance with R.A. 1866, as amended.

SECTION 10.4.5.3 STORAGE

- A. The manufacture of explosives or blasting agents shall be prohibited unless such manufacture is authorized by law.
- B. Explosives, including special industrial high explosive materials, shall be stored in magazines that meet the requirement of the Fire Code and this IRR.
- C. Smoking, matches, open flames, spark-producing devices, firearms and combustible materials shall be prohibited inside or within fifteen meters (15 m) from the magazine.
- D. The land surrounding magazines shall be kept clear or brush, dried grass, leaves, trash and debris for a distance of at least fifteen meters (15 m).
- E. Magazines shall be kept locked except when being inspected or when explosives are being placed therein or removed therefrom.
- F. Magazines shall be kept clean, dry and free of grit, paper, empty packages and rubbish.
- G. Magazines shall not be provided with other than approved artificial heat or light. Approved electric safety flashlights or safety lanterns may be used.
- H. Blasting caps, electric blasting caps, detonating primers and primed cartridges shall not be stored in the same magazine with other explosives.
- I. Packages of explosives shall not be unpacked or repacked in a magazine nor within forty-five and eight-tenths meters (45.8 m) of a magazine or in close proximity to other explosives. Opened packages of explosives shall be securely closed before being returned to a magazine.
- J. Magazines shall not be used for the storage of any metals, tools nor any commodity except explosives, blasting agents and oxidizers used in compounding blasting agents. The quantity of blasting agents and oxidizers shall be included when computing the total quantity of explosives for determining distance requirements.
- K. Floors of magazines shall be securely fastened in place and shall be capable of withstanding the loads imposed.
- L. The roofs and exterior sides of building-type magazines shall be made of concrete materials with fire resistance rating of two (2) hours.
- M. Magazines shall be ventilated to minimize dampness and heating of stored explosives. Ventilation openings shall be screened with 14 mesh,

no.21 protected in a manner that will maintain the bullet resistance of the magazine.

N. Doors and warning signs shall be in accordance with the provision of RA 1866 and its IRR, as amended.

SECTION 10.4.5.4 USE AND HANDLING

A. Use, handling and blasting operation of explosives shall be in accordance with RA 1866 and its IRR, as amended, and the following conditions:

1. No person shall handle explosives while under the influence of intoxicants or narcotics;
2. No person shall smoke or carry matches while handling explosives or while in the vicinity thereof;
3. No open flame light shall be used in the vicinity of explosives;
4. Whenever blasting is being conducted in the vicinity of gas, electric, water, fire alarm, telephone, telegraph or steam utilities, the blaster shall notify the appropriate representative of such utilities at least twenty four hours (24 hrs.) in advance of blasting, specifying the location and intended time of such blasting. In an emergency, this time limit may be waived by the City/Municipal Fire Marshal having jurisdiction;
5. Blasting operations shall be conducted in accordance with internationally recognized good practice;
6. Before a blast is fired, the person in charge shall make certain that all surplus explosives are in a safe place, all persons and vehicles are at a safe distance or under sufficient cover, and a loud warning signal has been sounded;
7. Due precautions shall be taken to prevent accidental discharge of electric blasting caps from current induced by radio or radar transmitters, lightning, adjacent power lines, dust storms, or other sources of extraneous electricity. These precaution shall include:
 - a. The suspension of all blasting operations and removal of persons from the blasting area during the approach and progress of an electrical storm;
 - b. The posting of signs warning against the use of mobile radio transmitters on all roads within one hundred seven meters (107 m) of the blasting operations;

- c. Compliance with internationally recognized good practice when blasting within two and a half kilometers (2.5 km) of broadcast or high power short wave transmitters.
- d. When blasting is done in a congested area or in close proximity to a building, structure, railway, highway or any other installation that may be damaged by material being thrown into the air, the blast shall be covered with an adequate blasting mat;
- e. Tools used for opening packages of explosives shall be constructed of non-sparking materials;
- f. Empty boxes and paper and fiber packing materials which have previously contained high explosives shall not be used again for any purpose, but shall be disposed of in a manner approved by the City/Municipal Fire Marshal having jurisdiction; and
- g. Explosives shall not be abandoned.

SECTION 10.4.5.5 TRANSPORTATION

- A. Every vehicle, when used for transporting explosives, shall be equipped with not less than two (2) fire extinguishers. Extinguishers shall be so located as to be readily available for use.
- B. Every vehicle transporting explosives shall be marked or labeled on both sides and rear with the word "**EXPLOSIVES**" in letters not less than eight centimeters (8 cm) in height a contrasting background.
- C. Vehicle transporting explosives traveling in the same direction shall not be given within one hundred meters (100 m) of each other.
- D. Vehicles transporting explosives shall not be left unattended at any time within inhabited or populated areas.
- E. Unauthorized persons shall not ride vehicles transporting explosives.
- F. Delivery shall only be made by authorized persons into approved magazines or approved temporary storage or handling area.
- G. Other safety measures in transporting of explosive shall be in accordance with the IRR of RA 1866, as amended.

DIVISION 6. FIREWORKS

SECTION 10.4.6.1 APPLICATION

This Division shall not apply to the use of fireworks by railroads or other transportation agencies for signals or purposes of illumination, or the sale or

use of blank cartridges for a show on theater, or for signal or ceremonial purpose in athletics or sports or for use of military organizations.

SECTION 10.4.6.2 FIRE SAFETY INSPECTION CERTIFICATE (FSIC) REQUIRED

No person shall manufacture, store, handle and/or use any firework materials of any kind or form without securing a Fire Safety Inspection Certificate (FSIC) from the City/Municipal Fire Marshal having jurisdiction, which is a prerequisite for the granting of permit issued by the PNP in accordance with R.A. 7183, as amended.

SECTION 10.4.6.3 MANUFACTURING PLANTS/PROCESSING STATIONS

A. Fireworks manufacturing plants/processing stations shall be made of concrete materials and shall be provided with the following:

1. Fire extinguishers shall be provided in accordance with Section 10.2.6.7 of this IRR;
2. Two (2) means of egress separate and remote from each other and terminates along safe refuge area;
3. Wet stand pipe of 1 ½ hose line;
4. Emergency plan; and
5. All electrical wiring installations shall be explosion proof and dust tight in accordance with Philippine Electrical Code.

B. Smoking within the premises of the manufacturing plant/processing station is strictly prohibited. Conspicuous signs that read "**WARNING — NO SMOKING — NO TRESPASSING**" shall be posted at frequent intervals around the plant perimeter.

C. All plant buildings containing pyrotechnic composition, explosive composition, or fireworks shall be locked securely at the end of the workday, or wherever plant personnel are not present to provide security.

D. The City/Municipal Fire Marshal having jurisdiction shall be permitted inside the plant without special permission of the person in charge;

E. No employee or other person shall be permitted to enter the plant while in possession of, or under the influence of, alcohol, drugs, or narcotics.

F. Each plant shall designate a safety officer who shall be responsible for general safety, fire prevention and protection, and employee safety training.

G. Stoves, exposed flames, and portable electric heaters shall be prohibited.

SECTION 10.4.6.4 STORAGE

Storage of fireworks and other pyrotechnics shall be in accordance with Republic Act No. 7183.

SECTION 10.4.6.5 DISPLAY CENTER

- A. Display centers for selling firecrackers and pyrotechnics shall be separated from each other by a firewall with a fire resistance rating of not less than two (2) hours;
- B. All malls and other similar establishments shall not be utilized as display centers for selling of firecrackers and pyrotechnics unless done through media presentation or other means without necessarily displaying the said firecrackers therein;
- C. Fire extinguisher/s shall be provided in accordance with Section 10.2.6.7 of this IRR;
- D. Smoking within fifteen meters (15 m) from a display center shall not be allowed;
- E. Testing of firecrackers and pyrotechnics shall be prohibited; and
- F. Stoves, exposed flames, and portable electric heaters shall be prohibited.

SECTION 10.4.6.6 CLEARANCE FOR FIREWORKS EXHIBITION

No person shall be allowed to conduct firework exhibition without first securing a clearance from the City/Municipal Fire Marshal having jurisdiction.

SECTION 10.4.6.7 REQUIREMENTS FOR FIREWORKS EXHIBITION

- A. That a permit to posses and display fireworks shall first be secured from the Philippine National Police;
- B. That fireworks be fired at a distance of one hundred feet (100 ft) away from people;
- C. That all fireworks shall project upwards;
- D. That a responsible person of at least twenty one years (21 yrs) and with adequate knowledge of handling fireworks shall be assigned to supervise fireworks display;
- E. That sufficient approved type of first aid fire protection equipment shall be on hand at the site during fireworks exhibitions; and
- F. That the nearest fire station shall be notified of such exhibitions.

SECTION 10.4.6.8 DISPOSAL OF UNFIRED FIREWORKS

Any fireworks that remain unfired after the display is concluded shall be immediately disposed properly.

DIVISION 7. APPLICATION OF FLAMMABLE FINISHES

SECTION 10.4.7.1 FIRE SAFETY CLEARANCE

A Fire Safety Clearance from the City/Municipal Fire Marshal having jurisdiction shall be issued for spraying and dipping operations utilizing flammable liquid, and powders included within the scope of this IRR.

SECTION 10.4.7.2 SPRAY FINISHING OPERATION OR PROCESSES

A. Construction

1. Electric wiring and equipment shall conform to the applicable provisions of the Philippine Electric Code.
2. Spray finishing operations shall not be conducted in buildings classified and used for assembly, educational, health care or residential occupancies except in a room-designed for the purpose, protected with an approved automatic fire control and extinguishing system and separated vertically and horizontally from other areas.
3. In other occupancies, all spraying operations performed inside a building shall be conducted in an approved spray booth, spray room or in spraying areas approved for such use.
4. Spray booths shall be substantially constructed of steel not less than one and two-tenths millimeters (1.2 mm) in thickness, securely and rigidly supported, or of concrete masonry except for aluminum or other approved substantial noncombustible materials, which may be used for intermittent or low volume spraying.
5. The interior surfaces of spray booths shall be smooth, continuous without edges and otherwise designed to prevent pocketing of residue and facilitate ventilation, cleaning, and washing without injury. Spray booths shall be designed to allow the free passage of exhaust air from all parts of the interior as well as to sweep air currents toward the exhaust outlet.
6. The floor of the spray booth and operator's working area shall be non-combustible, non-sparking material of such character as to facilitate the safe cleaning and removal of residue.
7. Distribution or baffle plates, if installed to promote an even flow of air through the booth or cause the deposits of overspray before it enters

exhaust ducts, shall be of non-combustible material and readily removable or accessible on both sides for cleaning. Such plates shall not be located in the exhaust ducts.

8. Each spray booth having a frontal area larger than one square meter (1 m^2) shall have a metal deflector or curtain not less than eleven and four tenths centimeter (11.4 cm) deep installed at the upper outer edges of the booth over the opening.
9. Each spray booth shall be separated from other operations by not less than ninety one and five tenths centimeters (91.5 cm), or by a greater distance, or by such partition, wall, or floor/ceiling assembly having a minimum fire resistance of one (1) hour to reduce the danger of juxtaposition of hazardous operations as the City/Municipal Fire Marshal having jurisdiction may require, except for spray enclosures used for drying at elevated temperature.
10. Spray booths shall be installed that all portions are readily accessible for cleaning. A clear space of not less than ninety-one and five tenths centimeters (91.5 cm) on sides shall be kept clear of any storage or combustible materials.
11. When spraying areas are illuminated through glass panels or other transparent materials, only fixed lighting units shall be used as a source of illumination. Panels shall effectively isolate the spraying area from the area in which the lighting unit is located, and shall be of non-combustible material of such a nature or so protected that breakage will be unlikely. Panels shall be arranged so that normal accumulations of residue on the exposed surface of the panel will not be raised to a dangerous temperature by radiation or conduction from the source of illumination.

B. Operation

1. Spraying operations, except electrostatic spraying operations, shall be designed, installed and maintained that the average air velocity from the spray impeller over the open face of the booth (or booth cross section spraying operations) shall not be less than thirty meters (30 m) per minute. Dry spray booths equipped with a filter roll that automatically advances when the air velocity is reduced to that specified in this paragraph shall be arranged to cause shutdown of spraying operations if the filter roll fails to advance automatically. Visible gauges or audible alarm devices shall be installed to indicate that the required air velocity is maintained.
2. Electrostatic spraying operations may be conducted with an air velocity over the open face of the booth of not less than eighteen meters (18 m) per minute or more depending on the volume of the

finishing material being applied and its flammability and explosion characteristics. Visible gauges or audible alarm or pressure-activated devices shall be installed to indicate or ensure that the required air velocity is maintained.

3. All discarded filter pads and filter rolls shall be immediately removed to a safe, well-detached location or placed in water-filled metal containers and disposed at the close of the day's operation unless maintained completely in water.
4. The storage and handling of flammable or combustible liquids in connection with spraying operations shall be in accordance with this Division.
5. The quantity of flammable and combustible liquids kept in the vicinity of spraying operations shall be the minimum required for operations and should not exceed a supply of one (1) day or one (1) shift. Bulk storage of portable containers of flammable and combustible liquids shall be in separate, constructed building detached from other important building or cut off in a standard manner.
6. Originally sealed containers, approved portable tanks, approved safety cans, or a properly arranged system of piping shall be used for bringing flammable or combustible liquids into spray finishing room. Open or glass containers shall not be used.
7. Drying, curing or fusion apparatus in connection with spray application of flammable and combustible finishes shall conform to NFPA 86, "Standard for Ovens and Furnaces", and the requirements of this IRR.
8. Spray booths, rooms or other enclosures used for spraying operations shall not be alternately used for drying by any arrangements, which will cause a material increase in the surface temperature of the spray booth, room, or enclosure.
9. Except as specifically provided in paragraph "B" (7) of this Section, drying curing, or fusion units utilizing a heating system having open flames or which may produce sparks shall not be installed in a spraying area as defined. However, it may be installed adjacent thereto when equipped with an interlocked ventilating system arranged to:
 - a. Thoroughly ventilate the drying space before the heating system can be started;
 - b. Maintain a safe atmosphere at any source of ignition; and
 - c. Automatically shut down the heating system in the event of failure of the ventilating system.

10. Automobile refinishing spray booths or enclosures, otherwise installed and maintained in conformity with this Division, may alternately be used for drying with portable electrically infrared drying apparatus when conforming with the following:

- a. The procedures shall be restricted to low-volume, occasional spray application;
- b. The interior (especially floors) of spray enclosures shall be kept free of overspray deposits;
- c. During spray operations, the drying apparatus and electrical connections and wiring thereto shall not be located within the spray enclosure nor in any other location where spray residue may be deposited;
- d. Spraying apparatus, drying apparatus and ventilating systems of the spray enclosure shall be equipped with suitable interlocks so arranged that:
 - i. The spraying apparatus cannot be operated while the drying apparatus is inside the spray enclosure.
 - ii. The spray enclosure will be purged of spray vapors for a period of not less than three minutes (3 min) before drying apparatus can be energized.
 - iii. The ventilating system will maintain a safe atmosphere within the enclosure during the drying process and the drying apparatus will automatically shut off in the event of failure of the ventilating system.

C. Protection and Maintenance

1. The filters in a spray booth shall be located in such a manner as not to reduce the effective booth enclosure of the articles being sprayed.
2. Space within spray booths on the downstream and upstream sides of filters shall be protected with approved automatic sprinklers and/or fire control and extinguishing systems.
3. Filters or filter rolls shall not be used when applying a spray material known to be highly susceptible to spontaneous heating and ignition.
4. Clean filters or filter rolls shall be non-combustible or of approved type having combustibility not in excess of Class 2 filters as listed by Underwriters Laboratories, Inc. Filters. Filter rolls shall not be alternately used for different types of coating materials, where the combination of materials may be susceptible to spontaneous ignition.

5. Smoking and open flames shall be prohibited in any spray booths.
6. Finishing areas in the vicinity of dip tanks and paint storage rooms, "No smoking and open flames" signs in large letters on contrasting color background shall be conspicuously posted in such areas.
7. There shall be no open flames or spark-producing equipment or processes that may expose the surface and exceed the auto-ignition temperature of the material being sprayed in any spraying area or within six meters (6 m) therefrom, unless separated by a partition.
8. Space heating appliances, steam pipes or hot surfaces shall not be located in spraying areas where deposits of combustible residues may readily accumulate unless specifically approved for locations containing both deposits of readily ignitable residue and explosive vapors. There shall be no electrical equipment in any spraying area where deposits of combustible residue may readily accumulate, except in rigid conduits, boxes, or fittings containing no taps, splices or terminal connections, and except as hereinafter provided.
9. Electrical wiring, motors and other equipment capable of producing sparks or hot metal particles not subject to deposits of combustible residues but located above or adjacent to spraying area shall be of explosion-proof type approved for use in such hazardous location or shall be of the totally enclosed type or construction to prevent the escape of sparks or hot metal particles.
10. Electrical wiring, motors, and other equipment outside of, but within six meters (6 m) horizontally and three meters (3 m) vertically of an enclosed spraying area and not separated by partitions, shall not make sparks under normal operating conditions.
11. Electric lamps outside, but within six meters (6 m), of any spraying area and not separated by a partition, shall be totally enclosed to prevent the falling of hot particles and shall be protected from physical damage by suitable guards or by location.
12. Portable electric lamps shall not be used in any spraying area during spraying operations. Portable electric lamps, if used during cleaning or repairing operations, shall be of the type approved for hazardous locations in accordance with the Philippine Electrical Code.
13. All metal parts of spray booths, exhaust ducts and piping systems conveying flammable or combustible liquids shall be properly electrically grounded in an effective and preventive manner in accordance with the Philippine Electrical Code.
14. All spraying areas shall be provided with mechanical ventilation adequate to prevent the dangerous accumulation of vapors as well

as in removing flammable vapors, mists or powders to a safe location and capable of confining and controlling combustible residues, dusts and deposits.

15. Mechanical ventilation shall be kept in operation at all times, while spraying operations are being conducted and for a sufficient time thereafter to allow vapors from drying coated particles and dry finishing material residues to be exhausted. Where spray operations are conducted automatically without an operator constantly on duty, the operating controls shall be arranged that the spray apparatus cannot function unless exhaust fans are operating.
16. Each spray booth shall have an independent exhaust duct system discharging to the exterior of the building. However, multiple cabinet spray booths in which identical spray finishing material is used with a combined frontal area of not more than one and sixty-seven hundredths square meters (1.67 m^2) may have a common exhaust. If more than one (1) fan serves one (1) booth, all fans shall be interconnected that one (1) fan cannot operate without operating all.
17. Electric motors driving exhaust fans shall not be placed inside booths or ducts. Fan rotating elements shall be non-ferrous or non-sparking or the casing shall consist of, or be lined with, such material. There shall be ample clearance between the fan-rotating element and the fan casing to avoid a fire by friction, necessary allowance being made for ordinary expansion and loading to prevent contact between moving parts and the duct or fan housing. Fan blades shall be mounted on a shaft sufficiently heavy to maintain perfect alignment even when the blades of the fan are heavily loaded, with the shaft preferably to have bearings outside the duct and booth. All bearings shall be of the self-lubricating type, or lubricated from the outside duct.
18. Belts shall not enter the duct or booth unless belt and pulley within the duct or booth are tightly enclosed.
19. Exhaust ducts shall be constructed of steel having a thickness not less than that indicated in **Table 29** and shall be substantially supported:

Table 29: MINIMUM THICKNESS OF SPRAY BOOTH EXHAUST DUCTS, BY DIAMETER

Diameter of duct	Minimum thickness
20 cms or less	(0.60 mm)
20 to 46 cms inclusive	(0.75 mm)
46 to 76 cms inclusive	(0.90 mm)
Over 76 cms	(1.20 mm)

20. Unless the spray booth exhaust duct terminal is from a water-wash spray booth, the terminal discharge point shall be not less than one and eight tenths meters (1.80 m) from any combustible exterior wall or roof, nor discharge in the direction of any combustible construction or unprotected opening in any noncombustible exterior wall within seven and six tenths meters (7.60 m).

21. Exhaust ducts without dampers are preferred. However, if dampers are installed, exhaust ducts shall be maintained so that they will be in a full open position at all times the ventilating system is in operation.

22. Exhaust ducts shall have a clearance from unprotected combustible construction or material of not less than forty-five centimeters (45 cm). If combustible construction is provided with the following protection applied to all surfaces within forty-five centimeters (45), clearance may be reduced to the distances indicated in **Table 30**:

Table 30: CLEARANCE REQUIRED FROM EXHAUST DUCTS AND UNPROTECTED COMBUSTIBLE CONSTRUCTION FOR SPRAY BOOTHS, BY TYPE OF PROTECTION USED

Protection Used	Clearance required	
	cm	in
Gauge 28 sheet metal on $\frac{1}{4}$ -inch asbestos millboard.	30.48	12
Gauge 28 sheet metal on 1/8-inch asbestos millboard space out 1 inch (2.54 cm) on noncombustible spacers.	22.86	9
Gauge 22 sheet metal on 1-inch (2.54 cm) coated batts reinforced with wire mesh or the equivalent.	7.62	3
Where ducts are protected with an approved automatic sprinkler system, the clearance required in section "V" of this section may be reduced.	15.24	6

23. Air exhaust from spray operations shall not be directed so that it will not contaminate makeup air being introduced into the spraying area or other ventilating intakes.

24. Exhaust ducts shall be permitted to be round, rectangular, or other suitable shape. They shall be provided with doors, panels or other means to facilitate inspection, maintenance, cleaning and access to fire protection devices.

25. Containers supplying spray nozzles shall be of closed type or provided with closed metal covers. Containers not resting on floors shall be on non-combustible supports or suspended by wire cables. Containers supplying spray nozzles by gravity flow shall not exceed thirty eight liters (38l) capacity.

26. All containers or piping to which a hose or flexible connection is attached shall be provided with a shut-off valve at the connection.

Such valve shall be kept shut when not in use.

27. When pump is used to deliver products, automatic means shall be provided to prevent pressure in excess of the design working pressure of accessories, piping and hose.
28. All pressure hoses and couplings shall be inspected at regular intervals appropriate to its intended use. The hose and coupling shall be tested with the hose extended, and using the "in-service maximum operating pressures." Any hose showing material deformations, signs of leakage, or weakness in its carcass or at the couplings, shall be withdrawn from service and repaired or discarded.
29. Piping systems conveying flammable and combustible liquids shall be of steel or other materials having comparable properties of resistance to heat and physical damage. Piping systems shall be properly bonded and grounded.
30. Heaters shall not be located in spray booths nor other locations subject to the accumulation of deposits or combustible residue.
31. If flammable or combustible liquids are supplied to spray nozzles by positive displacement pumps, the pump discharge lines shall be provided with an approved relief valve discharging to a pump suction or a safe detached location, or a device provided to stop the prime mover if the discharge pressure exceeds the safe operating pressure of the system.
32. Whenever flammable or combustible liquids are transferred from one container to another, both containers shall be effectively bonded and grounded to prevent the discharge sparks of static electricity.
33. In addition to the automatic fire control extinguishing equipment provided for above, suitable portable fire protection equipment shall be provided near all spraying areas as required for extra hazardous occupancies. For continuous spray application, activation of fire extinguishing system shall automatically accomplish all the following:
 - a. Activate a local alarm in the vicinity of the spraying operation and activate the facility's alarm system, if such is provided.
 - b. Shut down the coating material delivery system.
 - c. Terminate all spray application operations.
 - d. Stop conveyors into and out of the spray area.
34. A manual fire alarm and emergency system shut-down station shall be installed to serve each spray area. When activated, this station shall

accomplish all the functions listed above. At least one (1) such station shall be within ready access of operating personnel. If access to this station is likely to involve exposure to danger, additional station shall be located adjacent to an exit from the area.

35. Automatic sprinklers protecting each spray booth (together with its connecting exhaust) shall be under an accessibly located separate outside stem and yoke (OS & Y) (gate valve mechanism) sub-control valve.
36. Sprinklers protecting spraying areas shall be kept as free from deposits or overspray residue as practical by cleaning daily if necessary. If covered, cellophane bags having a thickness of 0.076 mm or less, or thin paper bags shall be used. Coverings shall be replaced frequently so that heavy deposits of residue do not accumulate. Sprinklers that have been painted or coated, except by the sprinkler manufacturer, shall be replaced with the new listed sprinklers having the same characteristics.
37. All spraying areas shall be free from accumulation of deposits of combustible residue as practical, with cleaning conducted daily if necessary. Scrapers, spuds, or other tools used for cleaning purposes shall be of non-sparking material.
38. Residue scraping and debris contaminated with residue shall be immediately removed from the premises and properly disposed of. An approved metal waste cans shall be provided whenever rags or waste are impregnated with finishing material and all such rags or waste deposited therein are disposed of immediately after use. The contents of waste cans shall be properly disposed of at least once a day or at the end of each shift.
39. The use of solvents for cleaning operations shall be restricted to Class II and III liquids as defined in this IRR and those having flashpoints not less than 100°F, except that the solvents with flash points not less than those normally used in spraying operations may be used for cleaning spray nozzles and auxiliary equipment, provided that such cleaning is conducted inside spray booths and ventilating equipment is operating during cleaning.
40. Spray booths shall not be alternately used for different types of coating materials where the combination of the materials may be conducive to spontaneous ignition, unless all deposits of the first material used are removed from the booth and exhaust ducts prior to spraying with the second material.
41. Spraying shall not be conducted outside of predetermined spraying areas.

42. Clothing of spray finishing employees shall not be left on the premises overnight unless kept in metal lockers.
43. All electrical wiring and equipment of drying apparatus shall conform to the provisions of this IRR and shall otherwise be installed in accordance with the provisions of the Philippine Electrical Code. Only equipment of a type approved for hazardous locations as provided for in this IRR shall be located within forty five centimeters (45 cm) of the floor level. All metallic parts of drying apparatus shall be properly, electrically bonded and grounded.
44. The drying apparatus shall contain a prominently located, permanently attached warning sign indicating that ventilation should be maintained during the drying period and that spraying should not be conducted in the vicinity that spray will deposit on apparatus.

SECTION 10.4.7.3 DIPPING AND COATING PROCESSES

A. Construction

1. It shall be separated from other operations, materials, or occupancies by location, firewalls, fire partitions, or by other means allowed in this IRR.
2. Dipping and coating tanks shall be constructed of steel, reinforced concrete, masonry or other non-combustible materials and shall be securely and rigidly supported. Supports for tanks that exceed one thousand eight hundred nine five liters (1895 l) capacity or one square meter (1 m^2) of liquid surface shall have a minimum fire resistance rating of one (1) hour.
3. To prevent the overflow of burning liquid from the dipping and coating tank should a fire in the tank actuate automatic sprinklers, the following requirements shall be done:
 - a. Drain boards shall be arranged so that sprinkler discharge will not flow into the tank.
 - b. Tanks shall be equipped with automatic closing covers and overflow pipes.
 - c. The level of liquid in the dipping and coating tank shall be maintained not less than one hundred and fifty two millimeters (152 mm) below the top of the tank to allow the effective application of extinguishing agents in the event of fire.
 - d. Dipping and coating tanks that exceeds five hundred seventy liters (570 l) in capacity or ninety three-hundredths square meters (0.93 m^2) in liquid surface area shall be equipped with a properly

trapped overflow pipe leading to a safe location.

- e. The connection of the overflow pipe to the tank shall be made not less than one hundred and fifty two millimeters (152 mm) below the top of the tank.
4. Dipping and coating tanks that exceed one thousand eight hundred nine five liters (1,895 l) in liquid capacity shall be equipped with bottom drains automatically and manually arranged/operated to quickly drain the tank in the event of fire, unless the viscosity of the liquid at normal atmosphere makes this impractical. Manual operation shall be from a safe and accessible location. Where gravity flow is not practicable, automatic pumps shall be provided.
5. Such drains shall be trapped and discharged to a closed, properly vented salvage tank or to a safe outside location.
6. The diameter of the bottom drain pipe or pipes shall be sized to empty the dipping and coating tank within five (5) minutes, but in no case shall be less than that indicated in **Table 31**:

Table 31: DIAMETER OF BOTTOM DRAIN PIPES, BY TANK CAPACITY

Tank capacity (liters)	Pipe diameter (cm)
1900 to 2850	8
2851 to 3800	10
3801 to 9500	13
9501 to 15000	15
Over 15000	20

7. Where salvage tank or tanks are employed, their capacity shall be greater than the capacity of the dipping and coating tanks to which they are connected. Pumping arrangement shall be provided for the retrieval of the contents. The salvage tanks shall be emptied before the dipping and coating tank is refilled.
8. Dipping and coating process utilizing conveyor systems shall be arranged to automatically stop or cease motion in the event of fire and if the required rate of ventilation is not maintained.
9. Open flames, spark-producing equipment/devices, or equipment whose exposed surfaces exceed the auto-ignition temperature of dipping or coating liquid, shall not be located in the process area unless the said equipment or apparatus is of totally enclosed type and construction to prevent the escape of sparks or particles of hot metal.

10. Electrical wiring and equipment that is located in the process area and is subject to deposits of combustible residues shall be of explosion-proof type approved for use in such hazardous locations in accordance with the Philippine Electrical Code.
11. Unless specifically approved for locations containing both deposits of readily ignitable residue and explosive vapors, there shall be no electrical equipment in the vicinity of dip tanks or associated drain boards or drying operations which are subject to splashing or dripping or dip tank liquids, except wiring in rigid conduits or in threaded boxes or fittings containing no taps, splices or terminal connections and except as hereinafter specifically permitted relating to electrostatic apparatus.
12. Open flames or spark producing equipment, which is not separated by tight partitions, shall not be located within six meters (6 m) in any floor space outside the process area. Drying and fusion apparatus may be installed adjacent to process areas subject to applicable provision of this rule.
13. In order to prevent sparks from the accumulation of static electricity, all persons and all electrically conductive objects, including any metal parts of the process equipment or apparatus, containers of material, exhaust ducts, and piping systems that convey flammable or combustible liquids, shall be electrically grounded.
14. Hardening and tempering tanks shall conform to all applicable provisions of this Section and the following:
 - a. Tanks shall be located as far as practicable from furnaces and shall not be located on or near combustible floors.
 - b. Tanks shall be provided with a non-combustible hood and vent or other equally effective means, venting to the outside of the building to serve as a vent in case of fire. All such vent ducts shall be treated as flues and be kept away from combustible roots or materials.
 - c. Tanks shall be equipped with a mechanical high temperature limit switch arranged to sound the alarm when the temperature of the quenching medium reaches ten degrees (10°C) Celsius below flash point.
 - d. Hardening and tempering tanks of over one thousand eight hundred ninety five liters (1,895 l) capacity or two and thirty-two hundredths square meters (2.32 m²) surface area shall be protected as specified in section.
 - e. Air under pressure shall not be used to fill or to agitate oil in tanks,

unless the air feed system is provided with a mechanical shut off device that shall be activated to effectively eliminate airflow once the mechanical alarm system required above is actuated.

15. Dipping and coating processes of over five hundred seventy liters (570 l) capacity or ninety three hundredths square meters (0.93 m²) liquid surface area and containing liquids having a flash points above 93°C shall be protected with an approved automatic fire extinguishing system.
16. Covers arranged to close automatically in the event of fire shall be actuated by approved automatic mechanical devices and shall be arranged for remote manual operation.
17. Covers shall be made of non-combustible materials with overlap sides by at least twenty-five millimeters (25 mm) and have a recess or flange that extends downward around the tank when it is closed.
18. Chains or wire ropes shall not be used to support the cover or operating mechanism where the burning of a cord could interfere with the action of a device. All pulleys, catches, and other fasteners shall be made of metal and shall be attached to noncombustible mountings.
19. Dipping and coating process areas shall be provided with mechanical ventilation that is capable of confining the vapor area to not more than one thousand five hundred twenty five millimeters (1525 mm) from the vapor source and removing the vapors in a safe location. The concentration of the vapors in the exhaust stream of the ventilation system shall not exceed twenty five percent (25%) of the lower flammable limit. However, if the physical size of a process does not allow adequate removal of vapors by mechanical ventilation alone, a properly designed enclosure shall be provided and the ventilation shall be capable of confining all vapors to the enclosure.

B. Operation

1. Mechanical ventilation shall be kept in operation at all times while dipping and coating processes are being conducted and for a sufficient time thereafter to allow all vapors to be exhausted until the vapor area no longer constitutes a vapor source. Where dipping and coating processes are conducted automatically without an attendant constantly on duty, the operating controls shall be arranged so that the apparatus cannot function unless the exhaust fans are operating.
2. Flow coat operations shall conform to the requirements for dipping

and coating tanks, considering the area of the sump and any area on which paints flow as the surface area of a dipping and coating tank.

3. Paint shall be supplied by direct low pressure pumping arranged to automatically shut down by means of approved heat mechanical devices in case of fire, or by gravity tank not exceeding thirty-eight liters (38 l) in capacity.
4. The processes of roll coating, spreading, and impregnating, in which fabrics, paper or other materials are passed directly through a tank or through containing flammable liquids, or over the surface of a roller that revolves partially submerged in a flammable liquid, shall conform to the succeeding paragraph and to the other applicable provisions of the foregoing sections of this IRR.
5. The storage and handling of flammable liquids shall be in accordance with Section 10.3.4.2.1 and other pertinent provisions of the Fire Code of this Philippines and this IRR.

C. Protection and Maintenance

1. Dipping and coating processes shall only be conducted in a building designed for the purpose, protected with an approved automatic sprinkler system that is designed and installed in accordance with Section 10.2.6.5 of this IRR, and is separated vertically and horizontally from other areas by construction of non-combustible material with a fire resistance of two (2) hours.
2. It shall be located so that in the event of fire originating at the process of equipment, access to means of egress will not be impaired.
3. Controls shall be provided to automatically shut down the dipping or coating process and sound an alarm if the ventilating system fails.
4. Areas in the vicinity of dipping and coating operations, especially drain boards and drip pans, shall be cleaned on a regular basis to minimize the accumulation of combustible residues and unnecessary combustible materials. Combustible coverings and strippable coatings shall be permitted to be used to facilitate cleaning operations in dipping and coating areas. If residue accumulates in work areas, ducts, duct discharge points, or other adjacent areas, all dipping and coating operations shall be discontinued until conditions are corrected. Cleaning operations shall be conducted with ventilating equipment in operation.
5. Approved waste container shall be provided for rags or waste

impregnated with flammable or combustible material, and all such rags or waste shall be deposited therein immediately after use. The contents of waste cans shall be properly disposed of at least once a day or at the end of each shift.

6. Periodic inspections or tests shall be made of all process tanks including covers, overflow pipe inlets, outlets and discharges, bottom drains, pumps and valves, electrical wiring and utilization equipment, grounding and bonding connections, ventilation systems, and all extinguishing equipment. Any defects found shall be promptly corrected. Inspection shall be conducted at least monthly.
7. Areas in the vicinity of dipping and coating processes shall be provided with suitable portable fire extinguishers in accordance with Section 10.2.6.7 of this IRR.
8. Covers shall be kept closed when tanks are not in use.
9. Adequate arrangements shall be made to prevent sparks from static electricity by electrically bonding and grounding all metallic rotating parts and other parts of machinery and equipment and by the installation of static collectors or maintaining a conducive atmosphere by means such as high relative humidity.

SECTION 10.4.7.4 ELECTROSTATIC APPARATUS

A. Construction

1. A safe distance of six meters (6 m) shall be maintained between goods being painted or treated and electrodes, electrostatic atomizing heads or conductors of at least twice the sparkling distance. A suitable sign indicating this safe distance shall be conspicuously posted near the assembly.
2. Electrostatic apparatus shall be equipped with automatic controls which will operate without time delay to disconnect the power supply to the high voltage transformer and to signal the operator under any of the following conditions:
 - a. Stoppage of ventilation fans or failure of ventilating equipment from any cause.
 - b. Stoppage of the conveyor carrying goods through the high voltage.
 - c. Occurrence of a ground or of an imminent ground at any point on the high voltage system.
 - d. Reduction of clearance below that specified in para "A" (1) of this Section.

3. Adequate booths, fencing, railing, or guards shall be placed around the equipment so that, by either their location or character, or both, they assure that a safe isolation of the process is maintained from plant storage or personnel. Such railings, fencing, and guards shall be of conductive material, adequately grounded, and shall be at least one and a half meters (1.5 m) from processing equipment.
4. Electrodes and electrostatic atomizing heads shall be adequately supported in permanent locations, and shall be effectively insulated from the ground. Electrodes and electrostatic atomizing heads which are permanently attached to their bases, supports, or reciprocators, shall be deemed to comply with this Section. Insulators shall be non-ferrous and non-combustible.
5. High-voltage leads to electrodes shall be properly insulated and protected from mechanical injury or exposure to destructive chemicals. Electrostatic atomizing heads and any exposed elements shall be effectively guarded against accidental contact or grounding. Automatic means shall be provided for grounding the electrode system when it is electrically de-energized for any reason.

B. Operation

1. Electrostatic apparatus and devices used in connection with paint spraying and paint detearing operations shall be of a type conforming to internationally approved standards.
2. Transformers, power packs, control apparatus, and all other electric portions of the equipment, shall be located outside of the spraying or vapor areas, and shall conform to the requirements of the other provisions of this IRR.

C. Protection and Maintenance

1. Designate the process zone as dangerous with regard to fire and accident.
2. Signs designating the process zone as dangerous because of fire and accident hazards shall be conspicuously posted.
3. Identify the grounding requirements for all electrically conductive objects in the spray are, including persons.
4. Restrict access to qualified personnel only.
5. All insulators shall be kept clean and dry.
6. Drip plates and screens subject to paint deposits shall be removed and taken to a safe place for cleaning.
7. The spraying area shall be adequately ventilated.

SECTION 10.4.7.5 AUTOMOBILE UNDERCOATING

A. Operation

1. When approved by the City/Municipal Fire Marshal having jurisdiction, automobile undercoating spray operations conducted in areas having adequate natural or mechanical ventilation may be exempted from the requirements pertaining to spray finishing operations when using undercoating materials which are not more hazardous than kerosene (as listed by underwriters' laboratories in respect to fire hazard rating 30-40), undercoating materials using only solvents having a flash point in excess of thirty seven and eight-tenths degrees Celsius (37.8°C), or no flames are within six thousand one hundred millimeters (6100 mm) while such operations are conducted.
2. Undercoating spray operations not conforming to this provision are subject to all applicable provisions of this IRR.

SECTION 10.4.7.6 POWDER COATING

A. Construction

1. Electrical equipment and other sources of ignition shall conform to the requirements of the Philippine Electrical Code.
2. Exhaust ventilation shall be sufficient to maintain the atmosphere below the lowest explosive limits for the material being applied. All non-deposited air-suspended powders shall be safely removed via exhaust ducts to the powder recovery cyclone or receptacle. Powders shall not be released to the outside atmosphere.
3. The provisions of internationally recognized standards for ovens and furnaces shall apply.
4. Electrostatic fluidized beds and associated equipment shall be of approved types. The maximum surface temperature of this equipment in the coating area shall not exceed sixty-five and six-tenths degrees Celsius (65.6°C). High voltage circuits shall be designed so as not to produce a spark of sufficient intensity to ignite any powder-air mixture nor result in shock hazard upon coming in contact with a grounded object under normal operating conditions.
5. Transformers, power packs, control apparatus and all other electrical portions of the equipment, with the exception of the charging electrodes and their connections to power, shall be located outside of the power coating area or shall otherwise conform to the requirements of this IRR.

6. All electrically conductive objects within the charging influence of the electrodes shall be adequately grounded. The powder coating equipment shall carry a prominent, permanently installed warning sign regarding the necessity for grounding these objects.
7. Objects being coated shall be maintained in contact with the conveyor or other support in order to insure proper grounding. Hangers shall be regularly cleaned to ensure effective contact, and areas of contact shall be sharp point or knife's edges where possible.
8. Electrical equipment shall be so interlocked with the ventilation system, such that the equipment cannot be operated unless the ventilation fans are in operation.

B. Operation

1. Powder coating operations shall be conducted in:
 - a. Completely enclosed rooms made of non-combustible materials/construction with smooth surfaces designed to prevent accumulation of powder and to facilitate cleaning; or
 - b. Enclosed powder coating facilities which are adequately ventilated, or
 - c. Adequately ventilated spray booths meeting the requirements of this IRR.
2. The application of powders by means of non-electrostatic fluidized bed or powder spray gun normally requires the part to be preheated. Preheating is also sometimes used with electrostatic equipment. Care must be taken to insure that the temperature of the part to be coated does not exceed the ignition temperature of the powder being used.
3. Precaution shall be taken to minimize the possibility of ignition by static electrical sparks through static grounding, where possible, of powder transport, application and recovery equipment.
4. All areas shall be free from accumulation of powder coating dusts, particularly such horizontal surfaces as ledges, beams, pipes, hoods, booths and floors.
5. Surfaces shall be cleaned in such manner as to avoid scattering dust to other places or creating dust clouds. Vacuum sweeping equipment, when used, shall be of approved type for use in hazardous locations.
6. Care shall be exercised to prevent iron or spark-producing metals from being introduced into the powder being applied. Magnetic and filter type separators are recommended.

7. "NO SMOKING OR OPEN FLAMES" signs in letters on contrasting color background shall be conspicuously posted at all powder coating areas and powder storage rooms.
8. These provisions shall apply to finely ground particles protective finishing material applied in dry powder form by one of the following methods:
 - a. Fluidized bed
 - b. Electrostatic fluidized bed
 - c. Powder spray guns
 - d. Electrostatic powder spray guns
9. Each method requires certain essential protective measures, which shall be compatible with the method employed.

SECTION 10.4.7.7 ORGANIC PEROXIDES AND DUAL COMPONENT COATINGS

A. Operation

1. Extreme care should be exercised at all times in preventing the contamination of organic peroxide formulations with any foreign substance. Only spray guns and related handling equipment specifically manufactured for use with organic peroxide formulations shall be used. Separate pressure vessels/air handling fluid equipment shall be used for the resin and for the catalyst and they shall not be interchanged.
2. The wetted portion of the equipment and apparatus that handle organic peroxides formulations shall be made of stainless steel (300 series), polyethylene, Teflon, or other materials specifically recommended for the application.

B. Protection and Maintenance

1. Organic peroxides shall be stored in a cool detached building apart from other finishing materials. Only minimum daily requirements shall be brought to the processing area. Such material remaining at the spraying station at the end of a day's operation shall be carefully disposed of. Organic peroxides shall be kept away from all sources of heat including steam pipes, radiators, open flames or sparks and solar radiation.
2. Care shall be exercised in handling organic peroxide formulations to avoid shock and friction, which can cause decomposition and violent reaction.
3. Organic peroxides shall not be mixed directly with any cobalt

compounds or other accelerators or promoters as violent decomposition or explosion may result. To avoid the possibility of such accidental mixing, these materials shall not be stored adjacent to each other.

4. Smoking shall be prohibited and "**NO SMOKING**" signs shall be prominently displayed and only non-sparking tools shall be used in any area where organic peroxides are stored, mixed or applied.
5. Only designated personnel trained to use and handle organic peroxide formulations shall be permitted to work with such materials.
6. Extra care shall be exercised to prevent contamination of organic peroxide formulations with dusts or overspray residue resulting from the sanding or spray application of finishing materials. Such mixing can result in spontaneous fire or explosion.
7. All spilled organic peroxides formulations shall be promptly removed. Spilled material shall be absorbed by using a non-combustible absorbent and then promptly disposed of in accordance with the manufacturer's recommendation.
8. All spraying operations involving the use of organic peroxide formulations and other dual component coatings shall be conducted in spray areas that are protected by approved automatic sprinkler systems meeting the requirements of Section 10.2.6.5.

DIVISION 8. RIPENING PROCESSES

SECTION 10.4.8.1 FSIC REQUIRED

A Fire Safety Inspection Certificate shall be issued by the City/Municipal Fire Marshal having jurisdiction as required for any fruit and crop ripening processes using combustible or flammable gas, such as ethylene, acetylene and the like.

SECTION 10.4.8.2 CONSTRUCTION

- A. The location of buildings in which fruit ripening processes utilizing combustible or flammable gas are conducted shall be approved by the City/Municipal Fire Marshal having jurisdiction. In towns or municipalities without existing fire stations, the approving authority is the Provincial Fire Marshal having jurisdiction.
- B. Containers storing the gas or materials from which they are generated shall be built in accordance with internationally recognized practice.
- C. Electrical wiring and equipment shall be installed in accordance with the standards of the Philippine Electrical Code.

- D. Lighting shall be by approved electric lamps or fixtures.
- E. Ethylene generators shall be listed and labeled including documentation that ethylene concentration gas does not exceed twenty-five percent (25%) of the Lower Explosive Limit (LEL).

SECTION 10.4.8.3 OPERATION

- A. Gas piping shall be of iron pipe. Flexible connectors and hose, when used, shall be of approved type. Tubing shall be of brass or copper with not less one-eighth centimeters (0.125 cm) wall thickness.
- B. Ethylene gas shall be discharged only into approved rooms or enclosures. Valves controlling discharge shall be provided by positive and fail-closed control of flow.
- C. Ripening room shall be open for at least twenty minutes (20 min) every twelve hours (12 hr) of operation.
- D. Heating of ripening rooms shall be by indirect means utilizing low pressure steam, hot water, or warm air. Approved electric heaters or approved gas or kerosene heaters shall have sealed combustion chambers.
- E. Steam, hot water pipes and radiators, shall have a clearance of at least two and a half centimeters (2.5 cm) to combustible material.
- F. Gas heaters and their vents shall be installed in accordance with internationally recognized practice. Gas heaters shall be equipped with an automatic pilot device to shut off the gas supply whenever the flame is extinguished.
- G. Burners for gas or kerosene heaters shall be installed in such a manner that the air for combustion is taken from outside the ripening room and the products of combustion are discharged to the outside.
- H. Kerosene heaters shall be installed in accordance with the applicable provisions of Rule 10, Chapter 4, Division 14, "Oil Burning Equipment", of this IRR.
- I. Electric heaters shall be of a type having no exposed surface at a temperature higher than four hundred twenty six degrees Celsius (426°C) and with thermostatic elements that produce no sparks and shall be of a type approved for use in hazardous locations.
- J. Protective guards shall be provided around heaters to prevent the possibility of their being knocked over.

SECTION 10.4.8.4 PROTECTION AND MAINTENANCE

- A. Portable fire extinguisher shall be installed in building or structure with ripening rooms.
- B. Ripening rooms shall be cleared of all combustible materials at all time. Waste materials shall be disposed of properly.
- C. The combustible or flammable gas shall be introduced by some means under positive control and measured so that the quantity introduced does not exceed one (1) part of gas to one thousand (1,000) parts of air.
- D. Containers other than those in actual use shall be stored outside of the building or in a special building, except that not more than two portable approved containers not in actual use may be stored inside the building premises. Such inside rooms or portions of a building used for storage of these containers shall be constructed of fire resistive walls and doors with a fire resistive rating of not less than two (2) hours.
- E. Open flame heaters and open lights shall be prohibited in the ripening rooms.
- F. "**NO SMOKING**" signs shall be posted at every entrance and smoking shall be prohibited in the ripening rooms.
- G. Approved warning signs indicating the danger involved and necessary precautions shall be posted in conspicuous places.

DIVISION 9. FUMIGATION AND THERMAL INSECTICIDAL FOGGING

SECTION 10.4.9.1 FIRE SAFETY CLEARANCE

No person shall engage in fumigation or thermal insecticidal fogging without a fire safety clearance from the City/Municipal Fire Marshal having jurisdiction. An operational license for fumigators from the Fertilizer and Pesticide Authority (FPA) is a prerequisite for the issuance of such clearance.

For the issuance of clearance, the following must be complied with:

- A. The City/Municipal Fire Marshal having jurisdiction shall be notified in writing at least three (3) days before closing any structure or ship for fumigation or opening spaces for fogging.
- B. Notification shall provide the following information:
 1. Business name of the applicant, its address and contact number;
 2. Location or name of establishment/address to be fumigated or where fogging operations are to be conducted;

3. Fumigants or insecticides, as well as thermal devices, to be used;
4. Person(s) responsible for the operation; and
5. Date and time of operation

C. Notice of any fumigation or thermal insecticidal fogging shall be served at least one (1) day to the occupants involved in the premises to give them sufficient time for evacuation or appropriate preparation for the operation.

SECTION 10.4.9.2 SOURCES OF IGNITION

- A. All fires, open flames and similar sources of ignition shall not be allowed in spaces under fumigation or thermal insecticidal fogging. Heating, if needed, shall be done by indirect means with steam or hot water.
- B. Electricity shall be shut off during operations, except where circulating fans are used. Such equipment shall be designed and installed in accordance with the Philippine Electrical Code.

SECTION 10.4.9.3 WATCH PERSONNEL

- A. During operation, the premises shall be sealed to keep the fumigant suspended in the air. The owner/building administrator shall be responsible for the supervision of the operation. Indoor fogging operations shall be supervised within three (3) to five (5) hours from the time the premises are fumigated/fogged until all ventilation work is completed.
- B. For outdoor operations, the requesting party shall be the one responsible for the supervision.

SECTION 10.4.9.4 SEALING OF BUILDING

Depending on the construction of the building, doors, windows, and all crevices, cracks or openings in the building, or portion thereof, to be fumigated, except the exit, shall be sealed with tape and plastic sheet before fumigation materials are applied. In case of houses, a rubber tent shall be placed over the entire house to confine the poisonous gases or prevent them from escaping. Irrespective of the type of fumigant employed, paper or other similar non-fire retardant materials used as sealing or cover materials for buildings, except for approved tarpaulins, in excess of that required is prohibited.

SECTION 10.4.9.5 WARNING SIGNS

Whenever fumigants are used or stored, conspicuous warning signs bearing the "skull and crossbones" emblem with the words "**DANGER, POISON GAS! KEEP OUT!**" shall be posted on all doors and entrances to the premises and

upon all gangplanks and ladders from the deck, pier or land to the ship. The signs shall also include the name of the fumigant used; the fumigator's name and his/her address and telephone number; and the date and time of operation. Notices shall be printed in red ink on white background. Letters in the headlines must be at least 2 inches (51 mm) in height. A warning shall state that the occupied premises must be vacated at least two (2) to three (3) hours before the operation begins and shall not be reentered until the danger signs are removed by the proper authorities.

SECTION 10.4.9.6 VENTING AND CLEANUP

At the end of the exposure period, fumigators shall safely and properly ventilate the premises and contents and properly dispose all fumigant containers, residues, debris and other materials used in the fumigation.

SECTION 10.4.9.7 THERMAL INSECTICIDAL FOGGING LIQUIDS

No thermal insecticidal fogging liquid with a flash point below thirty-eight degrees Celsius (38°C) shall be used. During operation, fog shall not be blasted directly against any combustible object or materials, e.g. Cartons, papers, curtains and, or within 3 meters, therefrom.

SECTION 10.4.9.8 RESTRICTED FUMIGANTS

Use of Carbon Disulfide (CS₂) and Hydrocyanic Acid (HCN) shall be used only in agricultural fumigations.

DIVISION 10. REPAIR GARAGES

SECTION 10.4.10.1 CONSTRUCTION

- A. Repair garages shall be built in accordance with the National Building Code, and the provisions of this Section.
- B. A repair garage shall not be located within or attached to a building or structure used for any purpose other than a repair garage unless separated by walls and floor or floor-ceiling assemblies having a fire resistance rating of not less than two (2) hours.
- C. Any single area occupied for salesrooms, showrooms, offices, or similar spaces shall be separated from vehicle repair or parking areas by walls and floor or floor-ceiling assemblies having a fire resistance rating of not less than two (2) hours.
- D. Ceiling assemblies shall be constructed in such a manner as to restrict the passage of smoke, vehicle exhaust gases, and odors from the repair or parking area to these spaces.

- E. In cases of parts storage areas, it shall also be separated from all other portions of the building by walls or partitions and floor or floor-ceiling assemblies having a fire resistance rating of not less than two (2) hours.
- F. In areas of repair garages used for repair or servicing of vehicles, floor assemblies shall be constructed of noncombustible materials or, if combustible materials are used in the assembly, shall be surfaced with approved noncombustible material. Floors shall be liquid tight to prevent the leakage or seepage of liquids and shall be sloped to facilitate the movement of water, fuel, or other liquids to floor drains.
- G. In areas of repair garages where motor fuels are dispensed or where vehicles are serviced, floor drains shall be provided. They shall be properly trapped and shall discharge through an oil separator to the sewer or to an outside vented sump.
- H. The contents of oil separators and traps of floor drainage systems shall be collected at sufficiently frequent intervals to prevent oil from being carried into the sewers. Disposal of which shall be in accordance with Rule 10, Chapter 4, Division 2 and Section 10.3.4.2.1 of this IRR.
- I. Pits and sub-floor work areas shall comply with the following:
 - 1. Walls, floors, and piers shall be constructed of masonry, concrete, or other suitable noncombustible material.
 - 2. Pits shall have a minimum of two unobstructed means of egress. Steps shall be noncombustible, slip resistant, and constructed with no accessible storage space beneath.
 - 3. Pits and sub-floor areas shall be provided with an individual ventilating system capable of providing a complete air change every five minutes (5 min) with the intake located near floor level.
- J. Repair garages shall be limited in height and area, depending on the type of construction, and shall be provided with proper ventilation fire protective system in accordance with this IRR.
- K. Below-grade areas occupied for repairing, or communicating areas located below a repair garage, shall be continuously ventilated by a mechanical ventilating system having positive means for exhausting indoor air at a rate of not less than $1 \text{ m}^3/\text{min}$ per m^2 of floor area. An approved means of ventilation shall be provided for introducing an equal amount of outdoor air.

SECTION 10.4.10.2 OPERATION

A. Welding, Cutting and Hotworks Operations

1. Welding, cutting and hotworks operations shall be in accordance with Rule 10, Chapter 4, Division 17 of this IRR.
2. Electric arc welding generators or transformers, electrical wiring for light, power, heat, and signal or control circuits, as well as electrically operated equipments, tools, portable appliances, and devices shall be in accordance the Philippine Electrical Code.

B. Spray Painting And Undercoating

1. Spray application operations, and processes shall be confined to spray booths, spray rooms, or spray areas. There shall be no open flame devices or spark-producing electrical equipment or appliances within six and one-tenth meters (6.1 m) radial distance horizontally while such operations are conducted.
2. Undercoating materials shall be dry before starting the engine of the undercoated vehicle.
3. Where only a small portion of a vehicle is spray painted and no accumulations of paint residues are allowed to form, such occasional painting shall be permitted in an open area located not less than six and one-tenth meters (6.1 m) radial distance horizontally from all open flame devices or spark-producing electrical equipment or appliances.

SECTION 10.4.10.3 PROTECTION AND MAINTENANCE

A. Fire Protective System

1. Approved, supervised automatic sprinkler system shall be provided in repair garages in accordance with Section 10.2.6.5 of this IRR and under the following conditions:
 - a. Repair garages more than one (1) storey in height or located beneath another occupancy wherein such repair garage exceeds an area of seventy hundred thirty three square meters (743 m^2).
 - b. One-storey repair garages exceeding an area of one thousand one hundred fifteen square meters ($1,115\text{ m}^2$).
 - c. All below-grade floors of repair garages, the ceilings of which are less than sixty-one hundredths meter (0.61 m) above grade.
2. Approved portable fire extinguishers shall be provided in all repair garages conforming to the provisions of Section 10.2.6.7 of this IRR.

3. All repair garages that exceed a height of fifteen and two tenths meters (15.2 m), have parking levels below grade, or are unsprinklered and more than one (1) storey in height shall be provided with one or more standpipes conforming to the provisions Section 10.2.6.6.

B. Housekeeping

1. An authorized employee/ officer of the firm, or the owner shall make daily inspections of the garage and shall be responsible for the prompt removal or repair of any hazardous condition, including proper maintenance of equipment and safety devices and the immediate removal of accumulations of combustible materials.
2. Clear aisle space shall be maintained to permit ready access to and the use of fire-fighting equipment.
3. The contents of oil separators and traps of floor drainage systems shall be collected at sufficiently frequent intervals to prevent oil from being carried into the sewers.
4. Floors shall be kept clean and free of oil and grease. Only approved water solutions or detergents, floor-sweeping compounds, and grease absorbents shall be used for cleaning floors.
5. Metal lockers shall be provided for employees' clothes.
6. Approved metal receptacles with self-closing covers shall be provided for the storage or disposal of oil-soaked waste or clothes.
7. Combustible rubbish shall be placed in covered metal receptacles until removed to a safe place for disposal. Contents of such containers shall be removed daily.
8. "**NO SMOKING**" signage's shall be conspicuously posted on hazardous areas in accordance to Division 3, Chapter 5, Rule 10 of this IRR.

DIVISION 11. LUMBER YARDS, WOOD PROCESSING AND WOODWORKING FACILITIES

SECTION 10.4.11.1 CONSTRUCTION

A. Open Yard Storage

1. Driveways between and around lumber piles shall be at least four and a half meters (4.5 m) wide and maintained free from the accumulation of rubbish, equipment or other articles or materials. Driveways shall be so spaced that a maximum grid system unit of fifteen meters (15 m) by forty-five meters (45 m) is produced.

2. Permanent lumber storage, operating under a permit from appropriate government agencies, shall be surrounded with a suitable fence at least one and eight tenths meters (1.8 m) in height, unless storage is within a building.

B. Wood Processing and Woodworking Facilities

1. Building constructions shall be in accordance with the National Building Code (NBC) and other accepted international standards.
2. Processing and wood working facilities shall be properly compartmentalized and protected through fire walls and fire barriers to prevent spread of fire and explosions or both between sections of the facility with different hazards in accordance with Section 10.2.6.8 of this IRR.
3. Fire protection features shall include separation of adjacent building by open space, or separation of adjoining building areas by firewalls and fire partitions, or draft curtain boards as well as elimination of unnecessary opening through floors.
4. Raw material storage, finish product storage, manufacturing areas, non-manufacturing areas and high hazard occupancies shall be considered as different hazards.
5. Walls, floor, doors and openings shall comply with the following:
 - a. If walls are erected as firewalls between adjoining buildings, then they shall be designed for a minimum of four (4)-hour fire resistance rating.
 - b. Interior walls erected as fire barrier between adjoining areas shall be designed for a minimum of one (1)-hour fire resistance rating.
 - c. All penetrations of floors and walls shall be provided with firestopping having a fire resistance rating equal to that of the floor or wall.
 - d. Piping and ductwork shall not be embedded in firewalls.
 - e. Interior walls erected to isolate dust explosion hazards shall be designed for sufficient explosion resistance to preclude damage to these walls before the explosion pressure can be safely vented to the outside.
 - f. Where there are openings in fire-rated assemblies, including conveyor and chute openings, such shall be protected by approved, automatic-closing fire doors or fire dampers that have a fire resistance rating equivalent to the fire-rated assembly.

- g. Fire doors shall be installed in accordance with Section 10.2.5.3 of this IRR.
- h. Where there are openings in walls designed to be explosion resistant, such shall be protected by doors that provide the same degree of explosion protection as the walls. Such doors shall be kept closed at all times when not in use. Such doors shall not be considered as part of a means of egress. Such doors shall be marked "**NOT AN EXIT.**"

6. Surfaces and ledges in dusty areas shall comply with the following:
 - a. Interior surfaces and ledges shall be designed to minimize dust accumulation.
 - b. Surfaces not readily accessible for cleaning shall be inclined at an angle of not less than forty-five degrees (45°) from the horizontal to minimize dust accumulation.

SECTION 10.4.11.2 OPERATION

A. Open Yard Storage

1. Lumber shall be piled with due regard to stability of piles, and in no case higher than three meters (3 m). Where lumber is piled next to a property line, it shall not be less than three meters (3 m) in distance.
2. The burning of shavings, sawdust, and refuse materials shall be permitted only under boilers, in furnaces, or in incinerators or refuse burners safely constructed which will eliminate the danger from sparks such as an expansion chamber, baffle, walls, or other effective arrangements. At boilers or other points where sawdust or shavings are used as fuel, a storage bin of non-combustible, with raised sill, shall be provided.
3. Smoking shall be prohibited except in specified safe locations in buildings. Large "**NO SMOKING**" signs shall be painted on exterior buildings walls and on signs, erected at driveways' edges. "**NO SMOKING**" signs shall be posted throughout all buildings except in specified locations designated as safe for smoking purposes.
4. Weeds shall be kept down throughout the entire year and shall be sprayed as often as needed with a satisfactory weed killer or grubbed out. Dead weeds shall be removed.
5. Debris such as sawdust, chips and shorts shall be removed daily. Proper housekeeping shall be maintained at all times.

B. Wood Processing and Woodworking Facilities

1. Dust collecting system shall be designed in accordance with the Philippine Mechanical Code and the latest edition of NFPA 664.
2. Thermal oil heating system shall be in accordance with the Philippine Mechanical Code and the latest edition of NFPA 664.
3. Wood pulverizing operations shall be in accordance with the Philippine Mechanical Code and the latest edition of NFPA 664.
4. Composite board plants shall be in accordance with the Philippine Mechanical Code and the latest edition of NFPA 664.

SECTION 10.4.11.3 PROTECTION AND MAINTENANCE

A. Open Yard Storage

An approved yard hydrant system or water barrels and pails shall be provided for in open storage yards. Yard hydrant systems shall be installed in accordance with internationally accepted standards. Water barrels with three pails each shall be located at driveways so that a travel distance of at least ten meters (10 m) but not more than twenty-three meters (23 m) along driveways is needed from any part of the open yard to reach a barrel. Portable fire extinguishers shall be provided in accordance with Section 10.2.6.7 of this IRR.

B. Wood Processing and Woodworking Facilities

1. Deflagration venting

1. If a dust explosion hazard exists in equipment, rooms, buildings, or other enclosures, such areas shall be provided with deflagration venting. An approved fire suppression system installed in accordance with Section 10.2.6.5 of this IRR.
2. Where room or building dust accumulations exceed three millimeters (3 mm) or where visible dust clouds exist, it shall be considered an explosion hazard. In such rooms or buildings, an explosion hazard shall be provided with damage-limiting construction, including deflagration venting to a safe outside location

2. Housekeeping

- a. Removal of static dust shall be made for systematic, thorough cleaning of the entire plant at sufficient intervals to prevent the accumulations of finely divided wood dust that might be dislodged and lead to an explosion.

- b. The use of compressed air or other similar means to remove dust accumulations from areas that are not readily accessible for cleaning by other methods shall be permitted only if done frequently enough to prevent hazardous concentrations of dust in suspension. Any open flame or spark-producing equipment shall not be used during blowdown.
- c. Any metal scrap, such as nails, band iron, or any wood containing metal, shall be separately collected and disposed so that it will not enter the wood-handling or processing equipment, the dust-collecting system, or the scrap wood hog.

3. Electrical installation and maintenance

- a. All electrical installation and maintenance shall comply with the provisions of Philippine Electrical Code.
- b. Static electricity shall be prevented from accumulating on machines or on equipment that is subject to accumulation of static electric charge by the following methods:
 - i. Permanent grounding and bonding wires
 - ii. Grounded metal combs
 - iii. Other effective means
- c. Lightning protection, if necessary, shall be installed in accordance with the Philippine Electrical Code.

4. Fire Protective System

- a. Portable fire extinguishers, and standpipes and hose systems, where required, shall be provided in accordance with Section 10.2.6.7 of this IRR. Hose stations of three and eight tenths centimeters (3.8-cm or 1 ½ inch) diameter shall be provided throughout all woodworking facilities.
- b. Automatic sprinklers, where required, shall comply with Section 10.2.6.5 of this IRR. Deluge heads shall be used to protect hard-to-reach areas, such as spaces between press cylinders.

DIVISION 12. MECHANICAL REFRIGERATION

The principal applications of refrigeration systems include, but not limited to, the following:

- A. Industrial, refining, and chemical

1. Controlling vapor pressure of volatiles during distillation, separation, or processing.
2. Shifting solubility relationships to permit segregation and removal of undesired contents, such as asphalt or wax, in lubricating oils.

B. Manufacture, freezing, preservation, and distribution of food products

C. Air conditioning

D. Manufacture, preservation, and distribution of medicine and drugs

E. Environment testing chambers

F. Cold treatment of metals

G. Industrial testing

H. Miscellaneous

1. Cold storage of flowers and furs.
2. Ice making and skating rinks

SECTION 10.4.12.1 CONSTRUCTION

All mechanical refrigeration systems shall be designed and installed in accordance with the provisions of this Division, PSME Code, IMC, NBC and other related acceptable codes.

SECTION 10.4.12.2 OPERATION

A. Operating Instructions

1. An operating instruction shall be posted conspicuously and as near as practicable to the refrigerant condensing unit.
2. The operating instruction shall include the following:
 - a. Instructions for shutting down the system in case of emergency;
 - b. Mechanical and substance specification;
 - c. The name, address and contact numbers for obtaining technical services; and
 - d. The name, address and telephone number of the local building official and the City/Municipal Fire Marshal having jurisdiction for notification.

B. Ammonia Diffusion Systems

1. Ammonia refrigerating plants containing more than thirteen and one half kilograms (13.5 kg) of refrigerant shall be equipped with facilities for diffusing the ammonia vapors.
2. Systems containing more than thirteen and one half kilograms (13.5 kg) of refrigerant shall be discharged to the outside of the building at least sixty one centimeters (61 cm) above the roof and so located that discharged refrigerants will not cause discomfort or harmful effects to persons or such discharge shall be directed into a tank of fresh water having a capacity of eight and a half liters (8.5 ℥) for each kilogram of refrigerant and used for no other than ammonia absorption.
3. Systems containing more than forty-five kilograms (45 kg) of refrigerant shall be provided with an approved diffuser consisting of sixty-three and one half millimeters (63.5 mm) hose connections, mixing chamber and a permanent discharge connection to the sewer or drainage system.
4. Control valves for diffusers shall be outside of the machinery room in a box protected against tampering. Such valve control box shall be plainly marked "**FOR FIRE SERVICE USE ONLY – AMMONIA CONTROL VALVES.**"

SECTION 10.4.12.3 PROTECTION AND MAINTENANCE

- A. All refrigeration equipments shall be kept clean, free from accumulations of oil, dirt, waste and other debris, and shall be easily accessible at all times and shall undergo preventive maintenance program.
- B. Each refrigerating system shall be provided with a legible metal sign permanently attached and easily noticeable, indicating thereon the name and address of the manufacturer or installer, the kind and total number of kilograms (pounds) of refrigerant contained in the system, and the field test pressure applied.
- C. Systems containing more than forty-five kilograms (45 kg) of refrigerant shall be provided with signs having letters not less than one and one fourth centimeters (1.25 cm) in height designating the main shut-off-valves to each vessel, main steam or electrical control, remote control switch and pressure limiting device.
- D. Valve control box shall be plainly marked "**FOR FIRE SERVICE USE ONLY – REFRIGERANT CONTROL VALVES.**"
- E. No person shall be allowed to use any ozone depleting refrigerants in any mechanical refrigeration system.

DIVISION 13. MOTION PICTURE PROJECTION

SECTION 10.4.13.1 CONSTRUCTION

- A. Every motion picture projection equipment, except those portable types, shall be kept securely fastened to a stable surface.
- B. Electrical wiring installation and location of associated electrical equipment and emergency systems/devices shall conform to the Philippine Electrical Code.
- C. Every projection booth shall be of not less than one (1)-hour fire resistive construction throughout and the walls and ceiling shall be finished with incombustible materials. The ceiling shall be not less than two and four tenths meters (2.40 m) from the finished floor. The room shall have floor area of not less than seven square meters (7 m^2) and three and a half square meters (3.5 m^2) for each additional machine.
- D. Every motion picture projection equipment, regardless of the type of film used, shall be enclosed in a motion picture projection room as provided in para "C" of this Section.
- E. No person shall handle, store, use, test, repair, duplicate, transport or destruct nitrate-based motion picture film without clearance, health and safety training and proper monitoring from the City/Municipal Fire Marshal having jurisdiction.

SECTION 10.4.13.2 OPERATION

- A. Processes like splicing, cleaning, repairing, cataloging and marking shall be done in projection rooms only.
- B. No person shall smoke or maintain any other source of ignition within any projection room; nor shall a manager or projectionist allow any person to smoke or to maintain any other source of ignition within said room.

SECTION 10.4.13.3 PROTECTION AND MAINTENANCE

- A. As a prerequisite for the issuance of FSIC, projectionists/operators shall undergo the required fire safety orientation/seminar to be conducted by the BFP.
- B. In every projection room there shall be installed at least two (2) approved first aid fire protection appliances of Class ABC type.
- C. The operator or any occupant shall, at all times, observe good housekeeping of the projection room.

DIVISION 14. OIL-BURNING EQUIPMENT

SECTION 10.4.14.1 GENERAL INSTALLATION REQUIREMENTS

- A. Use of oil burning equipment shall be of type acceptable to the Bureau of Product Standards of the Department of Trade and Industry (BPS-DTI).
- B. The grade of fuel used in a burner shall be that for which the burner is approved, and as stipulated by the manufacturer. Crankcase oil or any oil containing gasoline shall not be used.
- C. The installation shall be made in accordance with the Philippine Mechanical Code, with plans duly sealed and signed by a professional mechanical engineer and shall be submitted to the City /Municipal Fire Marshal having jurisdiction, and the following guidelines:
 1. Oil-burning appliances and equipment shall be installed so that a minimum of nine tenths meter (0.9 m) separation is maintained from any electrical panel board and a minimum of one and a half meters (1.5 m) separation is maintained from any unenclosed fuel oil tank.
 2. After installation, the appliance or equipment shall be tested for proper operation and combustion performance to make certain that the burner is operating in a safe and acceptable manner and that all accessory equipment, controls, and safety devices function as intended.
 3. Contractors installing industrial oil-burning systems shall furnish diagrams showing the main oil lines and control valves, one of which shall be posted at the equipment and another at a place that will be readily accessible in case of emergency.
 4. After completing the installation, the installer shall instruct the owner or operator on the proper operation of the equipment. The installer shall also furnish the owner or operator with name(s) and telephone numbers of person(s) to contact for technical information or assistance and for routine or emergency services.

SECTION 10.4.14.2 CONSTRUCTION, OPERATION AND MAINTENANCE

A. Electrical Services

1. Electrical wiring and utilization equipment used in connection with oil-burning appliances or equipment shall be installed in accordance with Philippine Electrical Code and the following guidelines:
 - a. Safety control circuits shall be 2-wire, 1 side grounded, with a nominal voltage not exceeding 220~230 volts;

- b. Safety controls or protective devices shall be connected so that they interrupt the ungrounded conductor and shut all fuel flow to the appliance, including fuel flow to any pilot flame or burner.
- c. The control circuit shall be connected to a power supply branch circuit fused at not more than the value appropriate for the rating of any control or device included in the circuit.

B. Fuel Oil Tanks

- 1. The design, construction and installation of fuel tanks shall conform to the standards of the American Petroleum Institute or other internationally accepted standards and the following:
 - a. Fuel oil supply tanks may be installed inside buildings provided that they are enclosed in accordance with Division 7, Chapter 5, Rule 10 of this IRR.
 - b. Stoves that are designed for barometric feed shall not be connected to separate oil supply tanks.
 - c. Unvented heating appliances shall be equipped with integral tanks with a capacity of not more than seven and a half liters (7.5 l).
 - d. Oil supply tanks other than those furnished as an integral part of the stove or range shall not be located within one and a half meters (1.5 m) horizontally, of any fire or flame except that tanks not over twenty three liters (23 l) capacity may be within this distance but not within sixty centimeters (60 cm) of the stove or range in which the burner is installed; provided that the temperature rise of the oil supply at this distance shall not approximate the flash point of the oil when the burner is operated at full capacity.
 - e. Tanks shall rest on the ground or on foundations made of concrete, masonry, piling, or steel. Tank foundations shall be designed to minimize the possibility of uneven settling and to minimize corrosion in any part of the tank resting on the foundation.
 - f. Where tanks are supported above the foundations, the supports shall be firmly anchored to the foundation. Supports shall be of concrete, masonry, or steel. Single wood timber supports (not cribbing) laid horizontally shall be permitted to be used for outside aboveground tanks if the supports are less than 12 in. (0.3 m) high at their lowest point.

C. Fill, Return, Supply and Vent Piping

- 1. A fill pipe on a tank larger than two hundred twenty seven liters (227 l) capacity shall terminate outside of a building at least sixty centimeters

(60 cm) from any building opening. Every fill pipe terminal shall be equipped with a tight cover.

2. A return line from a burner or pump to a supply tank shall enter through the top of the tank.
3. An auxiliary tank installed in the supply between a burner and its main supply tank shall be filled by pumping from the storage tanks.
4. All piping, except the burner supply line from a tank having a capacity not over two thousand liters (2,000 ℥) and the cross connection between two such tanks having an aggregate capacity of two thousand liters (2,000 ℥) or less, shall be connected into the top of the supply tank.
5. The burner supply connection to the tanks or tanks having a capacity of more than two thousand liters (2,000 ℥) shall be connected to the top of the tank. In commercial and industrial installations for numbers 5&6 oil, the burner supply connection may be below the liquid level but each such connection shall be provided with an approved valve.
6. Pressure feed from tanks is prohibited.
7. All tanks in which a constant oil level is not maintained by an automatic pump shall be equipped with an approved method of determining the oil level.

D. Pumps, Piping and Valves

1. An oil pump, not part of an approved burner, shall be of a positive displacement type, which automatically shuts off the oil supply when the oil pump is stopped.
2. All piping shall be standard full weight wrought iron, steel or brass pipe with standard fittings or brass or copper tubing fittings of an approved type, except that approved flexible metal hose, may be used for reducing the effect of jarring and vibration or where rigid connections are impractical. Cast iron fittings shall not be used.
3. Aluminum tubing shall not be used between fuel oil tank and the burner unit.
4. Pipes used in the installation of all burners and appliances other than conversion range oil burner shall not be smaller than ninety-five millimeters (95 mm), iron pipe size on ninety-five millimeters (95 mm) outside diameter tubing.
5. Piping between conversion range burners and tanks shall be standard steel, wrought iron, or brass pipe not smaller than six and four tenths

millimeters (6.4 mm) in size or brass or copper tubing not less than eight millimeters (8 mm) outside diameter with a wall thickness not less than one and one fourth millimeters (1.25 mm).

6. Piping shall be substantially supported and protected against physical damage and, where necessary protected against corrosion. All buried piping shall be protected against corrosion.
7. Pipe joints and connections shall be made tight with suitable lubricant or pipe compound. Unions requiring gaskets or packing, right and left couplings, and sweat fittings, shall not be used in oil lines.
8. Proper allowance shall be made for expansion, contraction, jarring and vibration.
9. Where supplies are set below the level of the burner, the oil piping shall be so laid as to pitch toward the supply tank without traps.
10. Readily accessible manual shut-off valves shall be installed to avoid oil spillages during servicing. The valve shall be installed to close against the supply.
11. Where the shut-off valve installed in the discharge line of an oil pump that is not an integral part of a burner, a pressure relief valve shall be connected into the discharge line between the pump shut-off valve and arranged to return surplus oil to the supply tank or to bypass it around.
12. Where oil is supplied to a burner requiring uniform flow by gravity feed and a constant level valve is not incorporated in the burning assembly or the oil is not supplied by an automatic pump, a constant level valve shall be installed in the supply line at the gravity tank or as close thereto as practicable, to insure uniform delivery of oil to the burner. The vent opening of such constant level valve shall be provided with an anti-flooding device. Vent piping or tubing or constant level valve shall not be connected to tanks or tank vents.

E. Conversion Oil Burners and Oil-Fired Units

1. Oil burners other than oil stoves with internal tanks, shall be provided with some means for manually stopping the flow of oil to the burner. Such device or devices shall be placed in a convenient location at a safe distance from the burner.
2. Oil burners for which a competent attendant will not be constantly on duty in the room where the burner is located while the burner is on operation shall be equipped with a primary safety control or a type specifically approved for the burner with which it is used. When primary safety controls are installed in connection with other oil

burners, such automatic devices shall be of a type specifically approved for use with the burner to which they are attached.

3. Each appliance fired by conversion oil burners, and each oil-fired unit, shall be provided with automatic limit controls which will prevent unsafe pressure or low water in a steam boiler or over-heating within a hot-water boiler, furnace or heater.
4. Limiting controls and low water shut-offs intended to prevent unsafe operation of heating equipment by opening an electrical circuit to the burner or shut-off device shall be so arranged as to effect the direct opening of that circuit whether the switching mechanism is integral with the sensing element or remote from same.
5. A water heater shall be provided with water pressure, temperature, and vacuum relief devices. Means shall be provided to prevent ship honing in any boiler or tank to which any circulating water heater is attached.
6. Electric motor-driven oil burners or a type not equipped with primary safety controls with integral oil pumps and electric motor-driven pump sets for use with such burner, not equipped with integral pumps, shall be provided with a motor controller incorporating no-voltage protection to be wired into the power supply to the motor.
7. In systems where either steam or air is used for atomizing the oil, or where air for combustion is supplied by a source which may be interrupted without shutting off the oil supply, the oil and atomizing or air supply shall be interlocked in a manner to immediately shut off oil supply upon failure of the atomizing or air supply.
8. Where automatically opened burners are used in installations equipped with force or induced draft fans or both, means shall be provided to immediately shut-off the oil supply upon fan failure.
9. Oil burners not equipped to provide safe automatic restarting after shut down shall require manual restarting after any control function to extinguish the burner flame.
10. Oil-fired appliances shall be installed in rooms that are large compared with the size of the appliance specifically approved for installation in a confined space such as an alcove or closet installation is in compliance with the approval. In alcove and closet installations, the clearances from the appliance to the walls and ceilings shall not be less than specified in the approval regardless of the type of construction.

F. Installation of Heating and Cooking Appliances

1. Kerosene and oil stove shall be equipped with a primary control furnished as an integral part of the appliance by the manufacturer to stop the flow of oil in the event of flame failure.
2. A conversion range oil burner shall be equipped with a thermal (heat-actuated) valve in the oil supply line, located in the burner compartment of the stove.
3. Oil burning appliance, small heating and cooking appliances shall be installed in accordance with NFPA 31 on Standards for the Installation of Oil Burning Equipment or with other internationally accepted standards.

DIVISION 15. ORGANIC COATINGS

SECTION 10.4.15.1 CONSTRUCTION

A. Process Building

1. Manufacturing of organic coating shall be done on buildings without basements or pits and shall be constructed with non-load bearing walls and with fire resistive construction of noncombustible materials.
2. Organic coating manufacturing operations and operations incidental to or connected with organic coating manufacturing shall not be located in the same building with other occupancies.
3. Each organic coating factory located within fifteen meters (15 m) of adjoining property or structures or public thoroughfare shall have the exposing wall constructed as indicated below:

Table 32: FIRE RESISTANCE RATING OF EXPOSING WALL OF ORGANIC COATING FACTORIES, BY DISTANCE FROM ADJOINING PROPERTY OR STRUCTURE

Distance from adjoining property or structure of public thoroughfare	Fire Resistance Rating of Exposing Wall
Less than 3 meters	At least 4 hours
3 meters to 9 meters	At least 3 hours
Over 9 meters but less than 15 meters	At least 2 hours

4. Raw materials and finished stock storage buildings shall be limited to one (1) storey in height and either detached or cut-off from manufacturing buildings by non-combustible construction having a fire resistance rating of at least two (2) hours. Openings shall be equipped with fire doors of at least one and a half (1.5)-hours fire resistance rating.

5. Stairway enclosures and structures housing elevators shall be enclosed by non-combustible walls having a fire-resistance rating of at least two (2) hours, and equipped with fire doors at least one and a half (1.5)-hours fire resistance rating.
6. Each manufacturing room shall have at least two (2) exits, well separated or remote from each other, one of which shall be directly to the outside. Access to all exits shall be kept clear and doors shall open in the direction of travel. Door fastenings shall be of the safety release type. Supervisory management offices, change and locker rooms located in manufacturing buildings shall be provided with exits adequate to accommodate the number of occupants. The means of egress shall not be exposed by drainage facilities.
7. Structures in which Class I liquids or finely divided flammable solids are processed shall be provided with explosion or deflagration venting.
8. Enclosed buildings in which Class I liquids are processed or handled in open containers and equipment shall be adequately or continuously ventilated at a rate of not less than one cubic meters per minute ($1\text{ m}^3/\text{min}$) for every six and a half square meters (6.50 m^2) of solid floor area. This shall be accomplished by exhaust fans taking suction at floor levels and discharging to a safe location outside the building. Provisions shall be made for introduction of non-contaminated intake air in such a manner that all portions of solid floor areas will be subject to continuous distributed movement of air.
9. Enclosed buildings in which Class I liquids are processed or handled in closed containers and equipment shall be equipped with a point-of-use and point-of-emission local exhaust ventilation system designed to prevent accumulation of flammable vapors during the operation of the equipment. This shall be accomplished by exhaust fans taking suction at all potential points of flammable vapor release from the equipment. During a shutdown period, when equipment is open and there is a potential for vapor emission, sufficient ventilation shall be provided to maintain a safe atmosphere.
10. Heating in hazardous areas, if required, shall be provided by indirect means. Ignition sources such as open flames or electrical heating elements except as provided in this IRR shall not be used within the building.
11. An organic coating manufacturing operation shall be accessible from at least one side for the purpose fire control. Approved aisles shall be maintained for the unobstructed movement of personnel and fire suppression equipment.
12. Where topographical conditions are such that flammable and com-

bustible liquids may flow from the organic coating manufacturing operation so as to constitute a fire hazard to properties of others, drainage facilities shall be provided in accordance with the following:

- a. Drainage facilities shall be provided to direct flammable and combustible liquid leakage and fire protection water to a safe location away from the building.
- b. Emergency drainage systems containing flammable and combustible liquids connected to public sewers or discharging into public waterways shall be equipped with traps or separator tanks.
- c. Emergency drainage systems for leaks of flammable or combustible liquids and for fire protection system discharge shall be provided and shall have curbs, scuppers, or special drainage systems to control the spillage and spread of fire. The containment area shall have a capacity not less than that of the largest tank that can drain into it.

B. Process Piping

1. All piping, valves and fittings shall be designed for the working pressures and structural stresses to which they may be subjected. They shall be of steel or other material approved for the service intended. Cast-iron valves, fittings, and pipe shall not be used.
2. Valves shall be of an indicating type. Terminal valves on remote pumping system shall be of the "dead-man" type, which will shut off both the pump and the flow of solvent.
3. Piping systems shall be substantially supported and protected against physical damage. Piping shall be pitched to avoid unintentional trapping of liquids, or suitable drains shall be provided.
4. Approved flexible connectors shall be installed where vibration exists or where frequent movement is necessary. Approved hose shall be used at dispensing stations.
5. Before being placed in service, all piping shall be hydrostatically tested to not less than one and a half (1 ½) times the expected working pressure or thirty five kilo Pascal (35 kpa) at the highest point in the system for a minimum of thirty minutes (30 min) to determine that the piping is free of leaks.

C. Electrical Equipment

1. All electrical wiring and equipment within storage or processing areas shall be installed to be reasonably safe to persons and property in accordance with the Philippine Electrical Code and other

internationally accepted standards.

2. Where Class I liquids are exposed to the air, the design of equipment and ventilation of buildings shall be such as to limit Class I liquid locations to pits, the interior of equipment and the "immediate vicinity" of pumps or equipment locations such as dispensing stations open centrifuges, plate and frame filters, opened vacuum filters, change cans, and the surfaces of open equipment. Immediate vicinity means a zone extending from the vapor liberation point six meters (6 m) horizontally in all directions and vertically from the floor to a level two meters (2 m) above the highest point of vapor liberation.
3. All locations not covered by this Section where Class I liquid's are handled shall be considered Class I, Second Division. If the flash point of the liquid processed is higher than the ambient temperature and at least thirty-seven and eight tenths degrees Celsius (37.8°C), ordinary electrical equipment may be used, though care shall be used in locating electrical apparatus to prevent hot metal from falling into open processing equipment.
4. Ordinary electrical equipment, including switchgear is prohibited, except if installed in a room, which is maintained under positive pressure with respect to the hazardous area. Air or other media for pressurization shall be taken from a location that will not cause any amount or type of flammable vapor to be introduced into the room.

D. Protection Against Static Electricity and Lighting

1. All equipment such as tanks, machinery and piping where an ignitable mixture may be present shall be bonded and connected to a ground. The bond or ground, or both, shall be physically applied or shall be inherently present by the nature of the installation. The resistance to ground of a metallic grounding path shall not exceed 25 ohms and the resistance to ground of a nonconductive or semi-conductive grounding path shall not exceed 1 million ohms (1 mega ohm).
2. Electrically isolated section of metallic piping or equipment shall be bonded to the other portions of the system or grounded.
3. Tank vehicles loaded or unloaded through open connections shall be grounded and bonded to the receiving system.
4. When a flammable mixture is transferred from a portable container to another, a bond shall be provided between the two containers, and one shall be grounded.
5. Steel or metal framing of buildings shall be grounded with resistance of not more than five (5) ohms.

SECTION 10.4.15.2 OPERATION

A. Storage of Raw Materials and Finished Products

1. Tank storage of raw materials for organic coatings inside building shall be permitted only in storage areas at or above grade that have drainage which are detached from the processing area or cut off from the processing area by non-combustible construction having at least a two (2)-hour fire resistance rating. Openings shall be equipped with doors having two (2)-hour fire resistance rating.
2. Tank car and tank vehicle loading and unloading stations for Class I liquids shall be separated from the processing area, other plant buildings, and nearest line of adjoining property that may be built upon or public thoroughfare by a clear distance of not less than eight meters (8 m). Tank cars for flammable liquids shall be unloaded such that safety to persons and property is ensured. Tank vehicles for flammable and combustible liquids shall be loaded and unloaded in accordance with Section 10.3.4.2.1 of this IRR.
3. Loading and unloading structures and platforms for flammable and combustible liquids shall be designed and installed in accordance with this IRR.
4. Finished products of organic coatings shall be stored outside of the buildings, in separate building, or in separate room cut-off from the processing area by a non-combustible wall or partition having at least a two (2)-hour fire resistance rating. Openings shall be equipped with doors having two (2)-hour fire resistance rating. The storage of finished products shall be in tanks or in closed containers.
5. The nitrocellulose storage shall be in a separate building or in a room cut off by non-combustible construction having a fire resistance rating of at least two (2) hours and openings shall be equipped with doors having a minimum of two (2)-hour fire resistance rating. The nitrocellulose storage shall be used for no other purpose and shall be protected by a sprinkler system that provides a density of fourteen and three tenths liters per minute per square meter (14.3 l/min ·m²) over the entire storage area. Electrical wiring and equipment installed shall be in accordance with the Philippine Electrical Code.
6. Nitrocellulose shall be stored in closed-containers. Barrels shall be stored in an upright position with the lid up and shall not be stored more than two (2) barrels high. Barrels or other containers of nitrocellulose shall not be opened in the main storage building but only at the point of use or other location intended for this purpose. The storage area shall be marked with a sign that states: "**NITROCELLULOSE — FLAMMABLE SOLID — KEEP HEAT, SPARKS, AND FLAME AWAY**" or

equivalent wording.

7. Spilled nitrocellulose shall be cleaned up immediately. Material that has dried or is suspected of having dried shall be wet with water or solvent and placed in a covered metal container and be disposed of properly.
8. This storage of organic peroxides shall be in accordance with Section 10.3.4.4.5 of this IRR.
9. The size of the package containing the organic peroxide shall be selected so that as nearly as practical, full packages are utilized at one time. Any peroxide spilled shall be promptly cleaned up and disposed of as recommended by the supplier.

B. Process Mills, Mixers, and Kettles

1. Mills operating with close clearances and used for the processing of flammable and heat sensitive materials such as nitrocellulose, shall be located in a detached building or in a non-combustible structure without other occupancy. The amount of nitrocellulose or other flammable material brought into the area shall be no more than that required for a batch.
2. Mixers shall be of the enclosed type, or if the open type shall be provided with properly fitted covers. Where flow is by gravity, a shut off valve shall be installed as closed as practical to the mixer and a control valve shall be provided near the end of the (fire) fill pipe.
3. Open kettle shall be located in an outside area, provided with a protective roof or in a separate building of non-combustible construction or separated from other areas by means of a non-combustible wall or partition having a fire resistance rating of two (2) hours.
4. The vaporizer section of heat-transfer system heating closed kettles containing solvents shall be remotely located. Contact-heated kettles containing solvents shall be equipped with safety devices that in case of fire can turn the process heat off, turn the cooling medium on, and inject inert gas into the kettle.
5. The kettle and thin-down tank shall be instrumented, controlled and interlocked so that any failure of the controls will result in a safe condition. The kettle shall be provided with a pressure rupture disc in addition to the primary vent. The vent piping from the ruptured disc shall be of a minimum length and shall discharge to a safe location. The thin-down tank shall be adequately vented. Thinning operations shall be provided with a vapor removal system capable of ensuring a safe atmosphere.

C. Transfer of Raw Materials

1. The transfer of large quantities of flammable and combustible liquids shall be through a closed piping system by means of pump or by gravity flow. The use of compressed air as a transfer medium is prohibited.
2. Pumps shall be selected for the raw materials used, the working pressures and the structural stresses to which they may be subjected.
3. Where solvents are pumped from storage to points of use, emergency switches shall be provided in the processing area, at an exit door or other safe location outside the process area, and at the pumps to shut down all the pumps and to stop the flow of flammable or combustible liquids in case of an emergency.
4. Empty and filled containers shall be stored outside the filing area.

SECTION 10.4.15.3 PROTECTION AND MAINTENANCE

A. Raw Materials in Process Areas

1. The amount of nitrocellulose brought into the operating area shall not exceed that required for a shift. Any nitrocellulose which may be spilled on the floor or elsewhere shall be promptly swept up, put into a pail of water, and removed at the end of the day shift and disposed of properly.
2. Organic peroxides brought into the operating area shall be in the original shipping container and shall not exceed the quantity required for a shift. When in the operating area, the peroxide shall not be placed in locations exposed to ignition sources, heat or mechanical shocks.

B. Fire Control And Detection

1. Manufacturing and storage buildings shall be protected by an automatic sprinkler system equipped with fire-fighting foam that is suitable for use with the materials being protected, where properly designed in accordance with standard for the installation of sprinkler systems; standard for low-expansion foam; or standard on the installation of foam-water sprinkler and foam-water spray systems.
2. Appropriate portable fire extinguishers shall be provided in organic coating areas.
3. Where public hydrants and water mains are not available or are inadequate, private hydrants and water mains shall be provided.

4. An approved fire alarm system shall be provided.
5. All fire protection system installed shall be properly maintained and tested periodically.
6. In the absence of automatic sprinkler system, standpipe and hose systems shall be installed. One and a half inches (1 ½ in.), or two and a half inches (2 ½ in.), or a combination of both hose connections with combination nozzles/ spray nozzles shall be used.

C. Maintenance

1. The cleaning of tanks or vessels which have previously contained flammable or combustible liquids shall only be done under the supervision of competent persons who understand the fire and explosion potentials of the tanks.
2. When necessary to make repairs involving welding and cutting or hotworks, the work shall be authorized by the plant superintendent or responsible individual in charge before the work is started.
3. When necessary to enter a tank, pit manhole or other confined spaces, such entry can be authorized by the responsible individuals in charge.
4. Power operated industrial trucks shall be of a type approved for the location.
5. Open flames and direct-fired heating devices shall be prohibited in areas where flammable vapor-air mixture may exist.
6. Smoking shall be prohibited except in designated safe areas. An approved "**NO SMOKING**" sign shall be posted in all hazardous areas.
7. Empty containers previously used for flammable or combustible liquids shall be removed to a well detached outside location and if not cleaned on the premises, the empty container shall be removed from the plant immediately.
8. Storage in containers outside of buildings shall conform to applicable provisions of this IRR.
9. Adequate aisles shall be maintained for the unobstructed movement of personnel and fire protection equipment.

DIVISION 16. INDUSTRIAL OVENS

SECTION 10.4.16.1 CONSTRUCTION

A. Location and Construction

1. Ovens, oven heaters and related heat utilization equipment shall be located where they will present the least possible hazard to life and property. To prevent and minimize damage from fire or explosion, they may need to be surrounded by walls or partitions.
2. Ovens shall be located at or above grade, or if in basements at least fifty percent (50%) of the wall area of the room in which the oven is located shall be above grade, because basements below grade are difficult to ventilate and offer severe obstacles to proper explosion release.
3. Ovens shall be located in areas that are readily accessible with adequate space above them for automatic sprinklers, the proper use of hose streams, routine inspection and maintenance, and with adequate clearances to permit the proper functioning of explosion vents. Roofs and floors of the ovens shall be sufficiently insulated and ventilated to keep temperatures of combustible ceilings and floors below seventy-one degrees Celsius (71°C).
4. Ovens and the building that houses it shall be constructed of non-combustible materials throughout, except where the maximum oven operating temperature is not over seventy one degrees Celsius (71°C) and adequate guards shall be provided to protect personnel.
5. Ovens which may contain flammable air-gas mixtures shall be equipped with devices or relief vents for freely relieving internal explosions causative pressure.
6. All duct works shall be constructed of non-combustible materials. Ducts shall be made tight throughout and shall have no opening other than those required for the proper operation and maintenance of the system. Ducts passing through combustible well, floors or roofs shall have adequate insulation and clearances to prevent surface temperature from exceeding seventy-one degrees Celsius (71°C). Exhaust ducts shall not discharge near doors, windows, or other air intakes in a manner that will permit reentry of vapors into the building.
7. Ovens shall be well separated from valuable stock, important power equipment, machinery and automatic sprinkler rises, so there will be minimum interruption to production and protection if there are accidents to the oven. Combustibles in the vicinity of the oven shall be adequately separated or properly insulated.
8. Each oven shall have its own venting facilities.

B. Ventilation

1. Ovens, where flammable or toxic vapors are liberated, or through which products or combustion are circulated shall be ventilated by the introduction of a supply of fresh air and the proper exhaust to the outdoors. Discharge pipes shall not terminate within three meters (3 m) measured horizontally, from any door window or wood frame wall of any building. Such oven ventilation shall be arranged to provide vigorous and well distributed air circulation within the oven to insure that the flammable vapor concentration will be safely below the lower explosive limit at all times. Unless the oven is operated in accordance with specific approval specifying particular solvents and rate of ventilation, the rate of ventilation shall not be less than seventy five cubic meters (75 m^3) of fresh air per liter of solvent evaporated in continuous process ovens, and not less than three cubic meters (3 m^3) per minute per liter of flammable solvent evaporated in batch process ovens.
2. Exhaust duct openings shall be located in the area of greatest concentration or vapors.
3. All exhaust shall be by mechanical means using power driven fans.

SECTION 10.4.16.2 OPERATION

A. Operators Training

1. Operator training shall include information on: (1) combustion of air-fuel mixtures, (2) explosion hazards, (3) sources of ignition and ignition temperature, (4) atmosphere analysis, (5) handling of flammable and toxic atmosphere gases, (6) functions of control of safety devices, and (7) purpose and basic principles of the gas atmosphere generators.
2. Regular operators shall be retrained at intervals to maintain proficiency and effectiveness. New operators shall be thoroughly trained and tested in the use of equipment. Operators must have access to operating instructions at all times.
3. Operating instructions shall be provided by the manufacturer. These instructions shall include schematic piping and wiring diagrams as well as light-up, shut-down, emergency and maintenance procedures.

SECTION 10.4.16.3 PROTECTION AND MAINTENANCE

A. Inspection, Testing and Maintenance

1. The equipment manufacturer shall inform the user regarding the need for operational checks and maintenance and shall provide complete and clear inspection, testing and maintenance instructions. The final

responsibility for establishing an inspection, testing and maintenance program that ensures the equipment is in working order shall be of the user.

2. When the original equipment manufacturer no longer exists, plant personnel shall develop adequate operational checks and maintenance procedures.
3. An operational maintenance checklist shall be maintained and is essential to the safe operation of the equipment.
4. Foreign material, parts, and residue shall be removed from the recirculation blowers, exhaust blowers, heat exchangers, burner and pilot ports, combustion blowers, ductwork and equipment interiors. Ductwork shall be checked for obstructions.
5. It shall be the user's responsibility to prevent the flammable loading from exceeding the safety ventilation design capacity of the oven.
6. The operating and supervisory control equipment of each oven shall be checked and tested regularly, preferably once a week. At less frequent intervals, a more comprehensive test and check must be performed by an expert.
7. All deficiencies must be corrected promptly, and a regular cleaning program must be followed to cover all portions of the oven and its attachments. Access openings for cleaning the oven enclosure and the connecting ducts must be provided.
8. The program for inspecting and maintaining oven safety controls shall be in accordance with the NFPA Standards for Ovens and Furnaces.

B. Safety Controls

1. Safety controls shall be sufficient in number and substantially constructed and arranged to maintain the required conditions of safety and prevent the development of fire and explosion hazards.
2. Ventilation controls, suitably interlocked, shall be provided which will insure required ventilation of the system.
3. Fuel safety controls, suitably interlocked and arranged to minimize the possibility of dangerous accumulations of explosive air-fuel mixture in the heating systems, shall be provided.
4. Excess temperature controls shall be provided to maintain a safe operating temperature within the oven.
5. Conveyor interlocks shall be provided in conveyor ovens having a

flammable vapor hazard, so that the conveyor cannot move unless ventilating fans are operating and discharging the required amount of air.

C. Fire and Explosion Protection

1. Ovens containing or processing sufficient combustible materials to sustain a fire shall be equipped with automatic sprinklers or water spray. This shall include sprinklers in the exhaust ducts, when necessary.
2. The amount of fire protection required depends upon the construction and arrangement of the oven and materials in it. If combustible materials are processed, or if trucks or racks are combustible, fixed fire protection shall extend as far as necessary into the enclosure and exhaust ducts.
3. Where automatic sprinkler protection is not feasible or where other type of extinguishing means is better suited to provide the required protection, an automatic fire protection system shall be provided subject to the approval of the concerned City/Municipal Fire Marshal having jurisdiction.
4. There shall be appropriate portable fire extinguishers located near the oven, oven heater, and related equipment.
5. Ovens that may contain flammable gas or vapor mixtures shall be equipped with unobstructed relief vents to release internal explosion pressures.

DIVISION 17. HOTWORKS OPERATION

SECTION 10.4.17.1 FIRE SAFETY CLEARANCE FOR HOTWORKS OPERATION

A Fire Safety Clearance shall be secured from City/Municipal Fire Marshal having jurisdiction prior to any hotworks operations.

SECTION 10.4.17.2 LOCATIONAL SAFETY REQUIREMENTS

- A. All combustibles shall be relocated at least eleven meters (11 m) horizontally from the work site. If relocation is impractical, combustibles shall be protected with fire-retardant covers or otherwise shielded with metal or fire-retardant guards or curtains. Edges of covers at the floor shall be tight to prevent sparks from going under them, including where several covers overlap when protecting a large pile.
- B. If hotworks is done near walls, partitions, ceilings, or roofs of combustible construction, fire-retardant shields or guards shall be provided to prevent ignition.

- C. Hotworks shall not be attempted on a partition, wall, ceiling that has a combustible covering or insulation, or on walls or partitions of combustibles sandwich-type panel construction.
- D. Hotworks that is performed on pipes or other metal that is in contact with combustible walls, partitions, ceilings, roofs, or other combustibles shall not be undertaken if the work is close enough to cause ignition by conduction.
- E. All hotworks operations in confined spaces shall be adequately ventilated to prevent the accumulation of toxic materials or possible oxygen deficiency.

SECTION 10.4.17.3 OPERATION

- A. The designated working area shall be inspected at least once a day while the hotworks permit is in effect to ensure that it is a fire-free area.
- B. No device or attachment facilitating or permitting mixture of air or oxygen with combustible gases shall be allowed unless approved for the purpose.
- C. The user shall not transfer gases from one cylinder to another, or mix gases in a cylinder.
- D. When moving compressed gas cylinder by crane, suitable cradles shall be used in order to reduce the possibility of dropping. Ordinary rope slings or electro-magnets shall not be used.
- E. Welding equipment shall be inspected daily. Inspection and testing of equipment and components shall include regulators, torches, hoses and connections, piping, oxygen cylinders and manifolds, acetylene cylinders and manifolds, electrical wires for portable welding machines, fuses and the portable welding machine.
- F. Acetylene generators shall be of approved type and shall be plainly marked with the rate in cubic meter of acetylene per hour for which they are designed, the amount of weight of carbide necessary for a single charge, the manufacturer's name and address, and the name or number of the type of generator.
- G. Stationary generators shall be installed either in a well-ventilated one-storey non-combustible outside generator house, or in a well-ventilated room or compartment of ample size and of construction as outlined in the succeeding paragraphs, either in a one-storey building or on the top floor or roof of multi-storey building. The storage of fuel gas cylinder in such rooms or compartments shall not exceed a total volume of fifty-seven cubic meters (57 m^3) or twelve (12) kilograms in case of liquefied petroleum gas.

H. Inside generator rooms or compartments

1. The walls or partitions, floor, and ceiling on such room or compartments shall be constructed having a fire-resistance rating of not less than two (2) hours. Walls or partitions shall be of noncombustible construction and continuous from the floor to ceiling and shall be securely anchored. At least one wall of an inside generator room shall be an exterior wall.
2. Opening from the generator room or compartment to other parts of the building shall be protected by an approved self-closing fire door for a Class B opening and have a rating of at least one (1) hour or the swinging type and close into a rabbet, or otherwise be made tight to prevent passage of flame around edges. Exit doors shall be located to be readily accessible in case of emergency. Windows, if provided in partitions, shall be wired glass on approved metal-frames with fixed sash.
3. A portion of the exterior walls equal to not less than ten percent (10%) of the combined areas of the enclosing walls shall be of light non-combustible materials such as single thickness, single strength glass. Single thickness, single strength window glass skylights, or lightly fastened roof hatch covers, swinging doors in exterior walls opening outward, sheet metal siding or lightly fastened roofs, may be accepted in part or entirely in lieu of the glass area or its equivalent, provided the required percentage of explosion venting area is thus obtained.
4. Generators installed inside buildings shall be enclosed in a separate room. Exit doors shall be so located as to be readily accessible in case of emergency.
5. The installation of acetylene generators within buildings shall be restricted to buildings not exceeding one storey in height except on the roof or top floor of a building.
6. Operating instructions shall be posted in a conspicuous place near the generator or kept in a suitable place available for ready reference.

I. Portable generators

1. Portable generators shall not be used in rooms of total volume less than thirty five (35) times the total gas generating capacity per charge of generators in the room. The gas generating capacity in cubic meters per charge shall be assumed as three-tenths (0.3) times the weight of carbide per charge in kilograms. Generators shall not be used in rooms having a ceiling height of less than three meters (3 m).
2. No portable acetylene generator shall be moved by derrick crane or hoist while charged with carbide.

3. Portable generators shall be located at a safe distance from the welding position so that they will not be exposed to sparks, slag, or misdirection of the torch flame or overheating from hot materials or processes.
4. Portable generators shall be cleaned and recharged and the air mixture blown off outside buildings.

J. Oxygen-fuel gas welding, cutting and hotworks

1. Mixture of fuel gases and air or oxygen shall be guarded. No device or attachment facilitating or permitting mixtures of air or oxygen with flammable gases shall be allowed unless approved for the purpose.
2. Oxygen cylinders shall not be stored near highly combustible materials, especially oil and grease; or near reserve stocks of carbide and acetylene or other fuel-gas cylinders, or near any other substance likely to cause or accelerate fire; or in an acetylene generator compartment.

K. Piping of oxygen fuel gases

1. Except as provided in this Division, piping shall be of wrought iron, steel, brass or copper pipe, or approved seamless copper, brass or other approved gas tubing. Heavy duty piping and fittings may be used for conveying gas or liquid with pressures up to ten and fifty four-hundredths kilograms (10.54 kg) per square centimeters.
2. For pressures in excess of ten and fifty four-hundredths kilograms (10.54 kg) per square centimeter, extra heavy-duty pipe and fittings shall be used.
3. Joints in steel or wrought iron pipe shall be welded or made up with threaded or flanged fittings; or rolled, forged or cast steel, or malleable iron fittings may be used.
4. Joints in brass or copper pipe may be welded or made up with threaded or flanged fittings. Joints in approved seamless copper, brass or other approved non-ferrous gas tubing shall be made by means of approved fittings or, if of the socket type, with silver solder, or similar high melting point material.
5. Cast-iron fittings shall be prohibited.
6. Threaded connections in oxygen piping shall be tinned or made up with other suitable joint sealer applied to the thread of male coupling.
7. Acetylene piping shall be made of steel or wrought iron pipe only.

8. Oxygen piping shall be made of steel, wrought iron, brass or copper pipe or approved seamless non-ferrous gas tubing. Tubing shall be used only for pressures of ten and fifty four-hundredths kilograms (10.54 kg) per square centimeters or less.
9. Piping shall be protected against injury, and allowance made for contraction, expansion, jarring and vibration. If laid underground, it shall be protected against corrosion. Low points in piping shall be provided with drip pots and drain valves, the latter to be normally closed with screw caps or plugs. Oxygen piping shall not be placed in any location where it may be exposed to contact with oil.
10. All piping shall be tested and proven tight at one and one-half (1.5) times its maximum working pressure. Any medium used for testing oxygen lines shall be oil-free. Flames shall not be used to detect leaks.
11. All buried pipe and tubing and outdoor ferrous pipe and tubing shall be covered or painted with a suitable corrosion-resisting material.
12. No hotworks shall be performed on an acetylene or oxygen pipeline, including the attachment of hangers or supports, until the line has been purged. Only oil-free air, oil-free nitrogen, or oil-free carbon dioxide shall be used to purge oxygen lines.

L. Manifolding of Cylinders

1. Oxygen manifold shall not be located in an acetylene generator room, or in close proximity to cylinders of combustible gases. Oxygen manifolds shall be located away from highly flammable material, especially oil, grease or any substance likely to cause or accelerate fire.
2. The aggregate capacity of fuel gas cylinders connected to one manifold inside a building shall not exceed eighty four and nine tenths cubic meters (84.9 m³) of gas or one hundred thirty five kilograms (135 kg) in the case of liquefied petroleum gas. More than one such manifold each supplying one blowpipe or one machine may be located in the same room if separated with at least fifteen meters (15 m) distance.
3. It is necessary to manifold fuel gas cylinders having an aggregate gas capacity in excess of eighty-four and nine tenths cubic meters (84.9 m³) or one hundred fourteen kilograms (114 kg) of liquefied petroleum gas (LPG). Storage exceeding above amount shall be in separate room as provided for by this IRR, or cylinders shall be kept outside or in a special building. Buildings, rooms or compartments provided for such storage shall be well ventilated and be without open flame heating or lighting devices.

4. Cylinders stored inside of buildings shall be away from highly combustible materials and in locations where they are not subject to excessive rise in temperature, mechanical injury or tampering. All cylinders including empty ones shall have their caps in place and all valves tightly closed.
5. Acetylene and liquefied fuel-gas cylinders connected to a portable manifold inside a building shall be manifolded in a vertical position.

SECTION 10.4.17.4 PROTECTION AND MAINTENANCE

- A. Hotworks equipment to be used shall be in satisfactory operating condition.
- B. Where combustible materials, such as paper clippings, wood shavings, or textile fibers are on the floor, the floor shall be swept clean for a radius of eleven meters (11 m). Combustible floors (except wood on concrete) shall be kept wet, be covered with damp sand, or be protected by noncombustible or fire retardant shields. Where floors have been wet down, personnel operating arc welding or cutting equipment shall be protected from possible shock.
- C. Opening or cracks in walls, floors, or ducts within eleven meters (11 m) of the site shall be tightly covered with fire-retardant or noncombustible material to prevent the passage of sparks to adjacent areas.
- D. Conveyor systems that might carry sparks to distant combustibles shall be shielded.
- E. Fully charged hose line and at least one (1) fire extinguisher that are appropriate for the type of possible fire shall be available immediately at the work area.
- F. If hotworks is done in close proximity to a sprinkler head, a wet rag shall be laid over the head and then removed at the conclusion of the welding or cutting operation.
- G. In hotworks done inside ships docked/anchored on shore or in shipyards, and in tanks and confined spaces where a concentration of combustible fumes/gases and liquids are reasonably suspected, an explosimeter shall be employed to determine the level of combustible fumes/gases present. Hotworks shall not be permitted if the concentration of the fumes/gases falls between the lower explosive/flammability limit (LE/FL) and upper explosive/flammability limit (UE/FL). Standard range for LE/FL and UE/FL shall be based with internationally accepted standards.
- H. Under no conditions shall acetylene gas be generated, piped (except in approved cylinder manifold), or utilized at a pressure in excess of one and five-hundredths kilograms (1.05 kg) per square centimeters gauge

pressure, except when dissolved in a suitable solvent in cylinders manufactured according to internationally recognized safe practice.

- I. Acetylene gas shall not be brought in contact with unalloyed copper except in a blowpipe torch.
- J. Oxygen shall never be used from a cylinder or cylinder manifold unless a pressure-regulating device intended for use with oxygen, and so marked, is provided.
- K. Fuel gas shall never be used from cylinders, through torches or other device equipped with shut-off valves without reducing the pressure through a suitable regulator attached to the cylinder valve manifold.
- L. Cylinders, valves, regulators, hose and other apparatus and fittings containing or using oxygen shall be kept free from oil or grease. Oxygen cylinders, apparatus and fittings shall not be handled with oily hands or gloves or greasy materials.
- M. Oxygen and fuel gas cylinder and acetylene generators shall be placed far away enough from the welding position so that they will not be unduly heated by radiation from heated materials, by sparks or slag, or by misdirection of the torch flame.
- N. No gas welding or cutting shall be done in or near rooms or locations where flammable liquids or vapors, lint, dust, or loose combustible stocks, are so located or arranged that sparks or hot metal from the welding or cutting operations may cause ignition or explosion of such materials.
- O. Valves of cylinders used for hotworks operations shall be properly closed and the lines bled after use or when not in actual use. It is the responsibility of the PAI to oversee such measure every after hotworks operations is done.
- P. Oil or grease shall not be used for lubrication of welding, cutting and hotworkss equipment.
- Q. The use of liquid acetylene is prohibited.

R. Liquid oxygen

This provision shall be enforced in consonance with Section 10.3.4.2.1 of this IRR. Where liquid oxygen in a quantity exceeding three hundred eighty liters (380l) is to be used for welding and cutting, the container or containers shall be located outside or in a special building having no other occupancy except that related to the handling and gasification of the oxygen.

S. Hose and hose connection

1. Hose shall be capable of withstanding a hydrostatic pressure of fifty six kilograms (56 kg) per square centimeter.
2. A single hose having more than one gas passage, a wall failure of which would permit the flow of one gas into the other gas-passage, shall not be used. Where two hoses joined by a web so as to form integral lengths of double hose are used, the two hoses shall be identified as follows:
 - a. By exterior color, such as by employing green for oxygen and red for acetylene, or
 - b. If the entire exterior of both passages are of the same color, the two sides shall be distinguished by feel or touch (i.e., smooth versus rib or rough exterior surface).
3. When parallel lengths as oxygen and acetylene hoses are taped together for convenience and to prevent tangling, not more than ten centimeters (10 cm) shall be covered with tape.
4. Hose connections shall be clamped or otherwise securely fastened in a manner that will withstand twice the pressure to which they are normally subjected in service but in no case shall be less than a pressure of twenty-one kilograms (21 kg) per square centimeters.
5. Hoses shall be inspected frequently for leaks, burns, torn places, loose connections or other defects, which may render the hose unfit for service. Where hose shows excessive wear or has been subjected to flashbacks, it shall be inspected and tested at twice the normal pressure to which it is subject in service but in no case at less than fourteen kilograms (14 kg) per square centimeter before being returned to service. Defective length or hose shall be discarded.

T. Containers for calcium carbide

Containers used for the storage of calcium carbide shall be of metal of sufficient strength to insure handling without rupture, and shall be provided with a screw top or its equivalent. They shall be of water tight construction. Solder shall not be used on joints in such a manner that fire would break open the package. Packages shall be marked "**CALCIUM CARBIDE IS DANGEROUS IF NOT KEPT DRY.**"

U. Storage of calcium carbide in building

1. Storage of calcium carbide inside the building shall be in a dry waterproof and well-ventilated location.

2. Calcium carbide in excess of two hundred seventy three kilograms (273 kg) shall not be stored in a building containing other occupancy unless in acetylene generator room or compartment, in a one-storey building without a cellar or basement underneath the carbide storage section. Such rooms shall be constructed to have a fire-resistance rating of not less than one (1) hour, with opening to other parts of the building protected by approved self-closing fire doors or stationary wired glass windows in approved metal frame. The room or compartments may also be used for storage of fuel gas cylinders, but not oxygen. Adequate ventilation shall be provided. Metal tools shall not be located in the calcium carbide storage room.
3. Calcium Carbide in excess of two thousand two hundred seventy three kilograms (2,273 kg) shall be stored in one-storey buildings without cellar or basement and used for no other purpose except the storage of fuel gas cylinders, or in outside acetylene generator houses. Location of such storage buildings shall be outside congested mercantile and manufacturing districts. If the storage building is of non-combustible construction, it may adjoin other one-storey buildings if separated therefrom by unpierced firewalls. If detached, less than three meters (3 m) from such building, there shall be no opening in any of the mutually exposing side of such buildings within three meters (3 m). If the storage building is of combustible construction it shall not be within six meters (6 m) of any other one- or two-storey building, and at least within nine meters (9 m) of any other building exceeding two storeys.
4. Calcium carbide in unopened metal containers may be stored outdoors upon examination that they in good condition. Periodic reexaminations should be made to check for rusting or other damage to a container that might affect its water or air tightness.

DIVISION 18. SAFEGUARDING BUILDING CONSTRUCTION, DEMOLITION AND ALTERATION OPERATIONS

SECTION 10.4.18.1 FIRE SAFETY PROGRAM

- A. An overall construction, alteration, or demolition fire safety program shall be developed, administered and enforced by the owner during the said operations.
- B. The building owner shall designate a safety officer representing the contractor or builder in charge of fire protection and safety program of the building under construction, alteration or demolition. His responsibilities shall include maintenance and location of automatic fire suppression systems and protective equipment, general supervision of safeguards, and the establishment and maintenance of safe cutting and welding operations.

SECTION 10.4.18.2 SAFE GUARDING DURING CONSTRUCTION

A. Temporary offices and sheds

Construction of temporary office trailers, sheds, and other related facilities or structures for storage of tools and materials when located within the building, on the sidewalk, or within nine meters (9 m) from the building shall be of non-combustible materials. When located more than nine meters (9 m) from the building and constructed of combustible materials, it is desirable to separate them into small detached units.

B. Temporary enclosures

Only non-combustible panels, flame resistant tarpaulin or other acceptable materials of equivalent fire retardant characteristics shall be used to enclose structures temporarily. The enclosing material shall be fastened securely or guarded by construction so it cannot be blown against sources of ignition by the wind.

C. Scaffolding, shoring and forms

Unnecessary accumulations of combustible forms or form lumber shall be prohibited. Combustible forms or form lumber shall be brought into the structure only if needed and shall be removed as soon as stripping is complete. Those portions of the structures where combustible forms are present shall not be used for the storage of other combustible building materials.

D. Construction equipment

1. Internal combustion engines and associated equipment, such as air compressors, hoists, derricks, pumps, and similar devices, shall be so located that the exhausts will discharge well away from combustible materials. Where the exhausts are piped to outside the structure under construction, alteration, or demolition, a clearance of at least twenty three centimeters (23 cm) shall be maintained between such piping and combustible material.
2. Internal combustion equipment shall be shut down and allowed to cool sufficiently prior to refueling. Suitable fire extinguishers shall be provided on manned construction equipment utilizing fuel.
3. Service areas for construction equipment shall not be located within structures under construction.
4. Fuel for internal combustion engines shall not be stored within structures under construction.

SECTION 10.4.18.3 SAFEGUARDING DURING DEMOLITION

- A. Charged hose lines of an adequate number and size shall be provided where demolition work is performed in areas where floors are soaked with oil or other flammable liquid, dust accumulations are present, combustible insulation is present on floors, walls, ceilings/roofs and hotworks is being performed.
- B. Flammable and combustible liquids shall be drained from tanks and machinery reservoirs in a safe manner and removed from the building immediately. Particular attention shall be paid to the removal of residue and sludge accumulations if hotworks operations are involved.
- C. Smoking shall be prohibited throughout demolition areas.

SECTION 10.4.18.4 DEMOLITION USING EXPLOSIVES

If explosives are used in demolition work (implosion), all blasting operations shall be under the direct supervision of an individual who is legally licensed to use explosives and in possession of all the required permits prior to conducting the blasting operations in coordination with the Bureau of Fire Protection and other concerned government agencies.

SECTION 10.4.18.5 SAFEGUARDING DURING ALTERATIONS

The provision of Sections 11.4.18.2 and 11.4.18.3 of this IRR shall be followed.

SECTION 10.4.18.6 SAFEGUARDING UNDERGROUND OPERATIONS

A. Fire detection and protection systems

Suitable fire extinguisher shall be installed so that travel distance from any one point in a tunnel does not exceed ninety one meters (91 m) on a horizontal plane. Audible and visible alarm and emergency lighting for safe evacuation shall be required. Two means of communications with the surface shall be available at all times from all areas of the underground facility. All communications systems shall be tested weekly.

B. Fire communications systems

1. All areas within the underground facility and aboveground shall be provided with two means of reliable communications that shall be tested weekly.
2. Mobile equipment conductors and multi-conductor portable cables shall be protected or guarded to avoid physical damage. Equipment grounding conductors shall be provided in accordance with the Philippine Electrical Code.

3. Bare terminals of transformers, switches, motor controllers, and other equipment shall be enclosed to prevent accidental contact with energized parts. Enclosures for use in tunnels shall be rain tight, rainproof, or watertight as defined in NFPA 70, *National Electrical Code*, where necessitated by the environmental conditions.
4. Special attention shall be given to maintaining clear access and adequate workspace around electrical equipment in accordance with NFPA 70E, *Standard for Electrical Safety Requirements for Employee Workplaces*. Proper housekeeping shall be maintained to avoid fire hazards.
5. All non-energized metal parts of electrical equipment and metal raceways and cable sheaths shall be grounded and bonded to all metal pipes and rails at the portal and at intervals not exceeding three hundred five meters (305 m) throughout the tunnel.

C. Hazardous Operations and Procedures

1. The quantity of combustible materials to be used underground shall be kept to a minimum. Advance planning shall provide for the use of materials having the most favorable combination of high ignition points, low rates of combustion, and low emissions of smoke and harmful gases. Class I flammable liquids shall not be taken, stored, or used underground or within thirty meters (30 m) of a tunnel portal or shaft opening. Class II and Class III liquids shall be transported and stored in approved closed containers, safety cans, or tanks. Quantities shall be limited to those necessary for one work shift.
1. Lubricating oils, greases, and rope dressings taken underground shall be in closed and enclosable approved containers that do not allow the contents to leak or spill.
2. Oil, grease, and diesel fuel stored underground shall be kept in tightly sealed containers in fire-resistant areas located at least thirty meters (30 m) from shafts and inclines. Storage areas shall be positioned or diked so that the contents of ruptured or overturned containers cannot flow from the storage area.
3. Areas within eight meters (8 m) of major electrical installations and unburied tanks for storage of combustible liquids shall be free of transient combustible materials.
4. Fan houses, fan bulkheads for main and booster fans, and air ducts connecting main fans to underground opening shall be constructed of noncombustible materials.
- D. No combustible structure shall be erected and no combustible materials shall be stored within thirty meters (30 m) of an access shaft, shaft hoist, or

other entry. Metal containers with self-closing lids shall be provided and to store combustible waste and debris, and shall be removed and taken to surface daily.

- E. The ventilation system shall be sufficient for the number of personnel and equipment underground. Air-sampling logs shall be maintained. Air tests shall be conducted before each shift or after each shift. Air-sampling logs shall be available to the authority having jurisdiction.

CHAPTER 5. MISCELLANEOUS SAFETY MEASURES

DIVISION 1. WATER AND WASTE WATER TREATMENT PLANTS

SECTION 10.5.1.1 SCOPE

This Division shall cover the fire safety measures and explosion prevention at water and waste water treatment units, plants or facilities, including but not limited to their unit processes and operations, such as collection and pumping, liquid and solid treatment systems, and related appurtenances, service areas and premises.

SECTION 10.5.1.2 GENERAL SAFETY PRACTICES

- A. Basic control procedures shall be adopted by the plant owner or operator to minimize potential fire and explosion incidents in water or waste water treatment plants, and shall be contained in the Fire and Life-safety Assessment Report (FALAR) as prerequisite for the issuance of fire clearances and/or Fire Safety Inspection Certificates by the City/Municipal Fire Marshal having jurisdiction. It shall include hazard evaluation, process and equipment controls, ventilation, materials of construction, and education.
- B. Observance of fundamental electrical safety practices shall be pursued by the plant owner or operator through proper electrical classification of hazardous locations, and the proper selection, installation, and operation of electrical equipment, motors, and devices that are suitable for these locations. Electrical systems, devices and installations, and its operations and maintenance shall comply with the Philippine Electrical Code and manufacturer's instructions and in cases where applicable, with the NFPA 70, *National Electrical Code* and other internationally accepted standards.
- C. The plant owner or operator or their duly authorized representatives shall ensure that the handling of chemicals, fuels and materials used, including but not limited to solvents, oxidizing materials, chlorine, lime, hydrogen, oxygen, acetylene, petroleum liquids, oils, and a variety of chemicals and specialty gases used in treatment processes, laboratory analyses and instrumentation calibration, and generated wastes in or around water or waste water treatment plants that present potential hazards of fire and explosion, shall be made in compliance with the applicable provisions of this IRR.

SECTION 10.5.1.3 HAZARD EVALUATION

- A. A hazard evaluation shall be initiated early in the design process and hazard prevention and protection recommendations shall be integrated into plant process specifications and design considerations.
- B. Identification of potential hazards associated with the raw water or raw waste water entering the plant, the materials used in the treatment processes, and materials or wastes produced by the treatment processes and operations shall be completely understood and evaluated.
- C. Risk evaluation shall prescribe specific control measures to be incorporated at the design stage of the plant, as well as during the operation and maintenance of the plant. These measures shall include, but not limited to, address fail-safe design, emergency controls, redundant instrumentation, occurrence of leaks and spills, venting and pressure relief systems, pipe and equipment support, anchorage and vibration prevention, and damage limiting construction in relation to fire and/or explosion.
- D. Special attention shall be given to more potential hazards associated with fuel gases, sewer and sludge gases, specialty gases, liquids, solids, dusts, their mixture or when mixed or reacted with oxygen or other gases, construction and maintenance materials, repairs and hotworks as sources of ignition, fire and/or explosion. As a result of this evaluation, a written plant safety plan shall be prepared and carried out through an integrated safety program, done and implemented in close coordination with the Office of the City/Municipal Fire Marshal having jurisdiction.
- E. The evaluation shall be reviewed and updated periodically as conditions at the plant change. A report shall be prepared and maintained by the plant operator/owner and shall be made available to the Office of the City/Municipal Fire Marshal having jurisdiction.

SECTION 10.5.1.4 PROCESS AND EQUIPMENT CONTROL

- A. Plant processes and equipment operations manuals shall be prepared and made available at all times to plant technicians and/or operators at their respective stations, readily made accessible for reference, even to the member of the BFP conducting inspections. These manuals shall identify or prescribed control of fire and explosions, covering among others the removal of possible accumulation of source of fuel or explosive materials, limitation of oxygen required for combustion, removal of sources of ignition, and means of fire suppression and explosion venting (prevention) and shielding (protection), as well as emergency evacuation when applicable.
- B. Identification of different potential sources of ignition shall be considered in each part of the plant system, whether collection, liquid treatment, solid treatment, or fuel and chemical handling. Control of ignition resulting

from one or more causes, such as open flames and hot surfaces, electrical arcs, sparks, or chemical reactions, shall be covered by the abovementioned manuals and shall comply with the applicable provisions of this IRR and/or in applicable cases by therein adopted Code of Practices prescribed by the manufacturer or internationally accepted standards.

C. To address control and/or reduce the potential for ignition within the plant, the following measures are prescribed:

1. All entry sites within a plant, collection system, manholes, pumping stations and other facilities shall be properly protected from unauthorized entries. It shall be provided with appropriate security system and protection, by or in combination of security fencing, lockable gates/doors, at least two (2) hours fire rated compartmentation, posting of guards and/or installation of electronic video camera monitoring system as applicable, and made accessible only to authorized personnel and/or persons in authority.
2. Introduction of ignition sources at these sites as well as other parts of the plant shall be limited and regulated by an accepted life and safety procedural guidelines, supervised by a certified safety practitioner. As a general rule, introduction of ignition sources in these sites or areas shall be limited and adequate ventilation shall always be provided. Provided further, in cases where hotworkss or repair, rehabilitation, maintenance and other related activities that may introduce ignition are carried in a water or waste water treatment plant, an appropriate Fire Safety Clearance shall first be secured from City/Municipal Fire Marshal having jurisdiction.
3. Application of removal by vacuum or coverage with foam shall be necessary in event that a foreign combustible material enters the sewer system.
4. Chemicals and fuels shall always be stored in accordance with applicable provisions of this IRR and/or manufacturer's instructions or international acceptable standards as adopted in the plant. Reactive chemicals shall always be stored separately with the foregoing reference to safety standards. In cases of having two or more degrees of safety, the most stringent degree of requirement shall prevail.

SECTION 10.5.1.5 VENTILATION

- A. Ventilation rates for enclosed spaces containing used water or waste water exposed to the atmosphere shall be based on the calculated vaporization rate of the most volatile liquid anticipated to be present in the plant.
- B. In considering ventilation requirements, the designer shall base his calculations upon the surface area of channels, tanks, or other vessels

containing the used water or waste water exposed to atmosphere, the temperature of used water or waste water, the ambient air temperature, and the vaporization rate of the volatile liquid. Allowance shall be made for vaporization of volatile liquid from the free water surface in connecting sewers within a reasonable distance from the structure, turbulence that may accelerate vaporization of the volatile liquid, inefficiency of the ventilation system in purging the enclosures, and any other factors that the designer could reasonably expect to effect the rate of release of the flammable vapour to the structure.

C. Ventilation rate shall conform to **Table 33** which presents typical ventilation rates for various areas in the treatment plants or shall be based on actual calculations whichever is greater. In reference to the said table, the following notes shall be considered:

1. The superscript (1) - prescribed the installation of combustible gas detector and alarm system to monitor and provide warnings for the explosive level of the confined combustible vapors.
2. The ventilation rates prescribed above are considered to be the minimum necessary for protection against combustible vapors.
3. Ventilation rates shall be increased above those recommended if unusual accumulations of volatile combustible liquid or combustible vapors are expected or if toxic gases may be present.

**Table 33: MINIMUM VENTILATION RATES IN
WATER AND WASTE WATER TREATMENT PLANTS**

Description	Ventilation Rates
Wet wells, screen rooms, and other enclosed spaces with used water or waste water exposed to atmosphere ⁽¹⁾	15 air changes per hour
Rooms or spaces intended for storage or conveyance of used water or waste water solids, (e.g., grits, sludge, hardened or cakes of fats and grease, etc.)	12 air changes per hour
Equipment rooms, tunnels, and other below grade spaces. <ul style="list-style-type: none"> • With gas piping and/or gas handling equipment⁽¹⁾ • With diesel fuel or other volatile combustible liquid tanks, pumps and supply piping⁽¹⁾ 	12 air changes per hour or 40 km/min velocity in tunnels or galleries
Without gas piping	10 air changes per hour or 27 km/min velocity in tunnels or galleries

SECTION 10.5.1.6 MATERIALS OF CONSTRUCTION

- A. For the purpose of this IRR, the selection and/or usage of materials for the construction of treatment plants shall require the understanding of its classification and suitability of its application as divided in three basic categories, such as: (1) combustible, (2) non-combustible, and (3) limited combustibility, and shall comply with NFPA 220, *Standards Types of Building Construction*, or applicable internationally accepted standards for treatment plants.
- B. Construction materials being considered for treatment plants shall be selected based on the fire hazard and fire risk evaluation. The application of these materials shall be based on the reduction or elimination of the effects of fire or explosion by maintaining structural integrity, controlling fire spread and smoke generation, preventing the release of toxic products of combustion, and maintaining serviceability and operation of the facility.
- C. All buildings or unit processes that are considered critical to the integrity of treatment plants shall be of non-combustible type and shall be constructed in accordance with the National Building Code of the Philippines. Fire safety measures in buildings as prescribed in this IRR and other internationally accepted standards shall also be observed.
- D. In specific cases for waste water treatment plants, notwithstanding the applicability of some provisions to water treatment plants for similar applications, the following prescriptions shall strictly be observed:
 1. Sewers that handle or may handle flammable or hazardous materials shall be of non-combustible materials.
 2. Manholes, factory-built pumping stations, and other structures entered by personnel that handle raw or partially treated waste water shall be constructed only of non-combustible materials.
 3. Non-combustible materials shall be used for air supply and exhaust systems. Provided, in cases when combustible or limited combustible materials are used to control corrosion, approved smoke and fire dampers shall be installed. A separate smoke ventilation system shall be preferred; however, smoke venting shall be allowed as integrated into normal ventilation system using automatic or manually positioned dampers and motor speed control.
 4. No cellular or foamed plastic materials shall be used as interior finish. Interior finishes shall provide a maximum degree of fire resistance, with minimum flame spread rate and smoke generation for particular application. This information shall be secured from material

manufacturers and supported by test certificates attesting to its validity.

5. In cases of plastic or fibreglass-reinforced plastic products and/or materials of construction in unit process, such as rotating biological contactors, bio-towers, filters or trickling filters, inclined plate or tube settlers, ventilation ducts, and other equipment which may be subject to corrosion, extreme care shall be taken with open flames, such as cutting torches, during maintenance or repair operations, as these materials may present a considerable fuel load, if ignited.

SECTION 10.5.1.7 EDUCATION

- A. The role of education in the promotion of general safety and mitigation measure shall be given importance in this particular case. In-house training programs, such as but not limited to plant emergency organization, and housekeeping, operation, repair and maintenance (preventive and rehabilitation), first aid, occupational health and safety, fire prevention and suppression techniques, for all plant personnel shall be established. A priority objective shall be to provide information on how to (1) understand, (2) identify, (3) prevent, and (4) handle hazardous sources or situation relating to potential fire, explosion, and toxicity problems.
- B. A close liaison shall be established, pursued and sustained between the City/Municipal Fire Marshal having jurisdiction, including other authorized emergency personnel, and treatment plant's owner or operator, specially its safety personnel so that mutually approved emergency procedures, including familiarity of the plant, shall be established.

SECTION 10.5.1.8 FIRE PROTECTION

The fire protection and suppression measures in treatment plants shall include but not limited to the following:

- A. Automatic Sprinkler Systems. Approved supervised Sprinkler Systems shall be installed in buildings or structures located at the treatment plant in accordance with Section 10.2.6.5 of this IRR and/or other internationally accepted standards. Provided further, that in certain areas, such as chemical storage areas, underground tunnels or structures, or areas where electrical hazard is a principal concern, the use of other appropriate fire protection measures shall be considered based on manufacturer's instructions and/or internationally accepted standards, subject to the evaluation and approval of the City/Municipal Fire Marshal having jurisdiction.
- B. Chemical Suppression System. Clean agent, chemical wetting agent, foam, and dry chemical systems shall be installed or used whenever

applicable, in buildings or structures located at treatment plants based on manufacturer's instructions and/or internationally accepted standards, subject to the evaluation and approval of the City/Municipal Fire Marshal having jurisdiction.

1. Chemical wetting agents, ionized water mists, and foam extinguishing systems effectiveness shall be considered or used for wet wells, grit and screening processes, primary clarifiers, and pits and tanks where floating flammable liquid may collect on the surface.
2. Clean agents, ionized water mists, inert gas suppressants, and carbon dioxide extinguishing systems effectiveness shall be considered or used where electronics and computer equipment are located.
3. Clean agent, ionized water mists, carbon dioxide, and dry chemical extinguishing systems shall be considered or used in chemical storage areas, underground tunnels or structures, or where electrical hazard is a principal concern and where water damage would seriously impair the integrity of the treatment plant.

C. Standpipes and Hydrants. Standpipes, hose streams, and hydrants shall be provided where appropriate in buildings or structures located at treatment plants in accordance with Section 10.2.6.6 of this IRR and/or other internationally accepted standards, subject to the evaluation and approval of the City/Municipal Fire Marshal having jurisdiction.

D. **Fire Suppression Supply Systems**

1. Water supplies shall be capable of delivering the total demand of sprinklers, hose streams, foam and other chemical systems in accordance with Sections 10.2.6.5 and 10.2.6.6 of this IRR.
2. In areas where there is no public water supply or where the public water supply is inadequate, treatment plant effluent or recycled water shall be used for fire protection.
3. In cases when the plant water system is used as the principal source for fire protection, the system shall be capable of providing an adequate quantity and pressure, and have sufficient standby capacity to meet all fire water flow requirements. If the plant water system is used as back up to public water supply, the system shall provide easy access and connections for pumper equipment or fire fighting apparatus.
4. When fire pumps are the source of supply used in the plant water system, multiple pumps with sufficient capacity to meet fire flow requirements, even with the largest pump out of service shall be provided. Pumps used shall be automatic starting with manual shutdown or mechanical equipment.

- E. Portable fire extinguishers of appropriate types shall be provided in buildings or structures located at treatment plant in accordance with Section 10.2.6.7 of this IRR and/or other internationally accepted standards, subject to the evaluation and approval of the City/Municipal Fire Marshal having jurisdiction. In some areas of treatment plant, such as basements, underground pipe galleries connecting buildings, and other areas which are not occupied continuously, optional reduction of the portable units shall be considered and may be requested, depending on frequency of occupancy, intended use and equipment contained in the space, and hazards potential for fire and/or explosion subject to the evaluation and approval of the City/Municipal Fire Marshal having jurisdiction.
- F. Special Fire Protection and Miscellaneous Measures. Special fire protection and miscellaneous measure shall be considered in some treatment plants and processes having unique problems or situations, such as but not limited to the following:
 - 1. Applicable special or alternative fire protection measures during construction at both new and existing treatment plant facilities shall be considered based on safety to life, protection of property, and potential for delays in construction, as well as plant or unit process start up as recommended by qualified fire safety/protection practitioner and subject to the evaluation and approval of the City/Municipal Fire Marshal having jurisdiction.
 - 2. Lightning protection shall be provided for structures in accordance with NFPA 780, *Lightning Protection Guide, Appendix L (Principles of Lightning Protection)*.
 - 3. Traffic flow and crowd management arrangements shall be made to permit rapid entry to the plant by firefighters, police and other authorized personnel of concerned government agencies, in cases of fire or other emergencies.
 - 4. The plant emergency organization, where provided, shall be properly instructed and trained in the use of all fire protection equipment located at the treatment plant.
 - 5. Early detection and notification system in case of fire and explosion shall also be established to protect the integrity of the buildings and unit processes. Protective measures to detect flame, heat or smoke shall be selected and installed where needed in accordance with Section 10.2.6.4 of this IRR and/or manufacturer's instruction and other internationally accepted standards, subject to the evaluation and approval of the City/Municipal Fire Marshal having jurisdiction.

6. Where appropriate, central station, local protective auxiliary, remote station, or proprietary sprinkler water flow alarms shall be provided based on manufacturer's instructions and/or other internationally accepted standards, subject to the evaluation and approval of the City/Municipal Fire Marshal having jurisdiction.

DIVISION 2. SMOKING

SECTION 10.5.2.1 DESIGNATED AND PROHIBITED SMOKING AREAS

- A. In areas where flammable and combustible materials are stored or handled, the City/Municipal Fire Marshal is empowered and authorized to order the owner or occupant in writing to post "**NO SMOKING**" signages in each building, structure, room or place in which smoking shall be prohibited. Such signs shall be conspicuously and suitably located. The City/Municipal Fire Marshal having jurisdiction shall designate specific safe locations, if necessary, in any building structure, or place in which smoking may be permitted.
- B. It shall be unlawful for any person during that period of the year declared by the City/Municipal Fire Marshal having jurisdiction as the hazardous season, to light, ignite or smoke any tobacco, cigarette, pipe, or cigar in or upon any brush or forest covered land or land covered with flammable materials. However, nothing in this section shall apply to the area within the boundaries of any established smoking areas as designated by the City/Municipal Fire Marshal having jurisdiction.

SECTION 10.5.2.2 NO SMOKING SIGNAGES

- A. The letters "**NO SMOKING**" shall be made readable and recognizable within a minimum distance of fifteen and one fourth meters (15.25 m) at any given time, at least ten centimeters (10 cm) high preferably with white-colored letters upon a red background. The posting location of such signs shall be in conspicuous places or as deemed required by the City/Municipal Fire Marshal having jurisdiction.
- B. Likewise, the designated smoking areas shall be properly identified by the placement of a signage identifying such area on its entrance. Such area shall adopt precautionary measures relative to fire safety.
- C. In no case shall a signage of "**SMOKING AREA**" be of different color from the "**NO SMOKING**" sign. The "**SMOKING AREA**" sign shall be posted on the entrance of the area designated as such.

DIVISION 3. MANUFACTURE AND SALE OF FIRE EXTINGUISHERS

SECTION 10.5.3.1 SCOPE

This Division prescribes the guidelines for the regulation of fire safety measures in the manufacture, sale, servicing and maintenance of fire extinguishers, including but not limited to prescribing standards and requirements thereof.

SECTION 10.5.3.2 MANUFACTURE AND SALE

No person shall engage in the manufacture, sale or servicing of extinguishers unless a permit or license is first obtained from the Department of Trade and Industry (DTI). A fire safety inspection certificate (FSIC) to be issued by the City/Municipal Fire Marshal having jurisdiction shall be prerequisite before the grant of a license to manufacture by the DTI.

A FSIC shall be issued only upon payment of two per centum (2%) of the manufacturer's/dealer's/servicing firm's gross sales.

A. Standards

1. All locally manufactured fire extinguishers shall be classified, tested and rated in accordance with the Philippine National Standards (PNS) No. 27:1984, *Rules for Classification, Fire Testing and Rating of Portable Fire Extinguishers*. Provided that in the absence, non-coverage or limitation of existing PNS on other quality standard requirements, adoption of other internationally accepted standards and/or alignment to the International Organization for Standardization (ISO) norms shall be applicable for its manufacture, including but not limited to its containers (cylinders or tanks), types of chemical extinguishing agents used, accessories and ancillary devices.
2. All extinguishers that are made and imported from other countries shall be considered acceptable when manufactured in accordance with International Organization for Standardization (ISO) norms and/or internationally accepted standards and/or listings or certifications, such as, but not limited to the following agencies:
 - a. National Fire Protection Association (NFPA)
 - b. Underwriter Laboratory, Incorporated (UL)
 - c. Factory Manual, Incorporated (FM)
 - d. American National Standards Institute (ANSI)
 - e. Loss Prevention Certification Board (LPC or LPCB)
 - f. European Committee for Standardization (CE or CEN)

- g. Australia Standards Association (ASA)
- h. Japan Industrial Standard Committee (JIS or JISC)
- i. Korea Fire Industry Technology Institute (KFI)

3. Nothing in this Section shall be construed as to preclude the use of other standards, if and when, such standards are proven to be equal or more stringent than the above-listed standards, as evaluated and recommended by the Fire Code Technical Staff and approved by Chief, BFP.

B. Fire Extinguishers Marks and Labels

All fire extinguishers manufactured or sold in the Philippines shall be marked and labeled providing the following information:

- 1. Containers (tanks or cylinders) shall have permanent markings (stamped, pressed or embossed) that identify its manufacturer (e.g., logo or initials or abbreviation or symbols), date of manufacture/fabrication, lot number and applicable standards (e.g., ASME, ANSI, ASTM, etc.) or patent registration in case of original invention.
- 2. Basic product labels or marks presenting the following information, among others:
 - a. Name, address, and contact details of the manufacturer and/or dealer
 - b. Date of original filling of the container
 - c. Chemical contents – The extinguishing agent shall be identified both under the common name and the chemical formula. Where the extinguishing agent is a formula, details on their proportions shall likewise be indicated.
 - d. Type of extinguishers
 - i. Whether or not useful for Class A, B, C, or D fires for locally manufactured types or appropriate classifications for imported types based on adopted standards; and
 - ii. Numerical rating of the extinguisher.
 - e. Opening instructions
 - f. Safety procedure in usage

C. Tagging of Serviced Fire Extinguishers

Whenever any person duly qualified by the Department of Trade and Industry or its equivalent services a fire extinguisher, a tag shall at least indicate:

1. The month and year the services are performed.
2. The chemical name and formula of the contents.
3. The type of extinguisher serviced.
4. The name, address, contact details and certificate of registration number of the servicing firm.

SECTION 10.5.3.3 SERVICING AND MAINTENANCE

- A. Maintenance and servicing of fire extinguishers shall be performed periodically, but at least once every twelve (12) months, after each use, or when an inspection shows that the need is obvious.
- B. Hydrostatic test shall be performed every five (5) years.

SECTION 10.5.3.4 CERTIFICATE OF COMPETENCY

- A. No person shall engage in the manufacture, sale or servicing of fire extinguishers without a certificate of competency issued by the BFP.
- B. All salesmen shall possess working knowledge on the following matters, among others, as a requirement for the issuance of certificate of competency:
 1. Principles of fire fighting;
 2. Types of extinguishers and their capabilities;
 3. Selection and matching the extinguishers to the hazard, the environment and the user's capability;
 4. Number and distribution of extinguisher for a particular hazard;
 5. Operation and maintenance of extinguishers; and
 6. Health and operational safety considerations.
- C. All technicians engaged in the manufacture, sale or servicing of fire extinguishers shall possess, in addition to those required of salesmen per para "B" above, working knowledge on standards in the following:
 1. Hydrostatic testing;

2. Safe filling and charging procedures;
3. Testing and rating procedures;
4. The various chemicals and formulation of extinguishing and their properties;
5. When and how to destroy any extinguisher container; and
6. Retrieval and disposal of prohibited or banned fire extinguishers.

SECTION 10.5.3.5 PROHIBITED TYPES OF EXTINGUISHERS

The following types of fire extinguishers and/or extinguishing agents are prohibited for manufacture or sale:

- A. All inverting types which require inversion of the extinguisher before its operation;
- B. Soda-acid extinguishers;
- C. Stored pressure or cartridge-operated foam solution, water or loaded stream;
- D. Vaporizing liquids (e.g. carbon tetrachloride);
- E. Thermal special hazards single station extinguishers with extinguishing capability of less than four and a half cubic meters (4.5 m^3);
- F. Fire extinguishers containing Ozone Depleting Substances (ODS); and
- G. Other types which may be prohibited and banned hereinafter by proper authorities.

SECTION 10.5.3.6 PROHIBITED ACTS

The following are declared prohibited acts with regard to fire extinguishers:

- A. Removal of inspection tags attached to fire extinguishers.
- B. Refilling a discharged extinguisher with an extinguishing agent other than what the unit was designed to contain.
- C. Selling extinguishers not appropriate to the hazard.
- D. Selling any extinguisher prohibited under Section 10.5.4.5 of this IRR.
- E. Selling defective or substandard extinguishers.

- F. Using/installing two (2) or more thermal special hazard vaporizing liquid unit in rooms with volume greater than the nominal capability of one unit.
- G. Installing pressure gauges in fire extinguishers that do not indicate the actual pressure of the interior of the fire extinguisher, such as, but not limited to, using defective or not calibrated gauges; not providing, or blocking the connection between the gauge and the interior; or fixing/tampering the indicator or needle to indicate a certain pressure.

DIVISION 4. OPEN BURNING

SECTION 10.5.4.1 WHEN ALLOWED

Open burning is allowed provided that a Fire Safety Clearance shall first be obtained from the City/Municipal Fire Marshal having jurisdiction.

SECTION 10.5.4.2 EXCEPTIONS

Fire SAFETY clearance shall not be required in the following:

- A. Fires for outdoor food cooking/preparation, provided that such fire is built and maintained in a pit fully containing the fire, or a fire proof container made of brick, stone, metal or other fire proof material TO prevent fire from spreading.
- B. Fires that are used for recreation and ceremony such as symbolic torch, camp fires, and religious/cultural fires provided that burning must be attended and supervised at all times.

SECTION 10.5.4.3 PROHIBITION ON OPEN BURNING

The following acts shall be prohibited:

- A. When atmospheric conditions or circumstances make the fire hazardous or produce excessive or unnecessary smoke, soot, odors, visible emissions, heat, flame or radiation so as to cause nuisance, hazard or to violate other laws, rules and regulations, issuances and ordinances, specifically as provided under IRR of RA 8749, such as:
 - 1. Burning using any materials in any quantities which shall cause the emission of toxic and poisonous fumes. Such materials include but not limited to plastic, polyvinyl chloride, polypropylene, paints, ink, wastes containing heavy metals, organic chemicals, petroleum related compound, industrial wastes, ozone depleting substances and other similar toxic and hazardous substances; and,
 - 2. Burning or cause open burning of waste materials in the premises of any establishment, firm, company, government or private entity or

organizations within the area of their jurisdiction, including recognized or unrecognized dumpsites in any quality or quantity.

- B. Discarding burning objects or dropping any lighted match, cigar, cigarette or other burning substance, on or near combustible material or in places where fire is likely to occur.
- C. Depositing hot ashes or cinders, or smoldering coals, or greasy or oily substances liable to spontaneous ignition, into any combustible receptacle.
- D. Kindling of fire upon the land of another without permission of the owner thereof or his agent.

SECTION 10.5.4.4 REQUIREMENTS

Outdoor burning, when authorized shall be subject to the following requirements:

- A. The location thereof shall not be less than fifteen meters (15 m) from any structure and adequate provision is made to prevent fire from spreading to within fifteen meters (15 m) of any structure.
- B. Burning is permitted only when wind direction and other meteorological conditions such as smoke and other pollutants will not present hazard to any public road, landing strip, navigable water, or have a negative effect on any building, structure or sensitive receptor/ electronic equipment.
- C. Any residual fires and/or smoldering objects that continue to emit smoke shall be extinguished each day at the end of the burning activity.
- D. Other fire safety measures necessary that may be imposed by the City/Municipal Fire Marshal having jurisdiction.

SECTION 10.5.4.5 PROCEDURES FOR OBTAINING FIRE SAFETY CLEARANCE

Application for fire safety clearance shall be filed in writing before the Office of the City/Municipal Fire Marshal having jurisdiction at least two (2) days prior to the date of burning.

SECTION 10.5.4.6 RESPONSIBLE PERSON FOR OUTDOOR BURNING

- A. The applicant shall be the responsible person for outdoor burning who shall be present prior and during the burning activity. He shall be liable for the consequences, damages, or injuries resulting from the said burning.
- B. The granting of the herein fire safety clearance does not exempt or excuse the applicant thereof from complying with all other applicable laws, ordinances, regulations and orders of governmental entities having jurisdiction.

DIVISION 5. INCINERATOR

Incinerators shall comply with the Implementing Rules and Regulations of Republic Act No. 8749 "Clean Air Act".

DIVISION 6. USE OF EQUIPMENT, APPLIANCES, DEVICES AND VACANT BUILDINGS

SECTION 10.5.6.1 TOY BALLOONS

No person without any authority from the City/Municipal Fire Marshall having jurisdiction shall inflate any toy balloon or other similar device with any toxic, explosive or flammable gas, or sell, give away or furnish any such balloon/device when so inflated. Open flame shall be prohibited in the vicinity where toy balloons are inflated, or where inflated toy balloons are present.

SECTION 10.5.6.2 TRACER BULLETS AND SIMILAR DEVICES

No person shall, possess or fire or discharge or cause to be fired any tracer bullet or tracer charge, or any type of projectile or device, such as fireworks, that discharges smoldering or flammable material, in any brush or grass-covered area, or any area where flammable materials are present.

SECTION 10.5.6.3 ASPHALT KETTLES

It shall be unlawful to transport over any highway, road or street any asphalt kettle beneath which is being heated by an open fire, coals or ashes. Heating of asphalt kettles inside or on the roof of any building shall be done only with authority from the C/MFM having jurisdiction concerned. There shall be at least one approved fire extinguisher of a minimum 12-B or C classification within nine meters (9 m) of each asphalt kettle being heated and one additional fire extinguisher of 16-B or C classification in the area of work being covered.

SECTION 10.5.6.4 ELECTRICAL WIRING AND OTHER DEVICES

A. Use and Installation

It shall be unlawful to use and/or install any electrical wiring appliance, apparatus or device in violation of the Philippine Electrical Code.

B. Fire Hazard

The City/Municipal Fire Marshall having jurisdiction shall notify the local Building Official of the existence of any hazardous electrical installation. He may order the use of such installation discontinued immediately until correction or the hazard be effected.

SECTION 10.5.6.5 ELECTRICAL APPLIANCES/DEVICES

No person shall sell, offer for sale, rent, dispose of by gift or premium, give or make available for use any electrical appliance, unless it is of an approved type.

SECTION 10.5.6.6 TRAPDOORS TO BE CLOSED

All trapdoors and scuttle covers, except those that are automatic in their operations, in any building other than single-family dwelling, shall be kept closed at all times, in order to prevent the easy passage of smoke and heat in case of fire.

SECTION 10.5.6.7 SHAFTWAYS TO BE MARKED

To preclude accidents during fire operations, every outside window in a building used for manufacture purposes or for storage which opens directly on any hoist way or other vertical means of communication between two or more floors in such buildings shall be plainly marked with the word "SHAFTWAY" in red letters at least fifteen centimeters (15 cm) on a white background. Such warning sign shall be placed as to be easily discernible from the outside of the building. Every door or window opening on such shaftway from the interior of the building shall be similarly marked with the warning word "SHAFTWAY" so placed as to be easily visible to anyone approaching the shaftway from the interior of the building.

SECTION 10.5.6.8 USE OF TORCHES OR FLAME-PRODUCING DEVICES FOR REMOVING PAINT

Any person using a torch or other flame-producing device for removing paint from any surface within a building or structure shall secure an authority from the City/Municipal Fire Marshall having jurisdiction and provide one approved fire extinguisher or water hose equipped with a suitable nozzle, sufficient in length to reach all portions of the building, and connected to the water supply on the premises where such operation is being done. In all cases, the person doing the removal of paint shall remain on the premises one hour after the torch or flame-producing device has been used.

SECTION 10.5.6.9 HAZARDOUS WARNING LIGHTS

It shall be unlawful to maintain any torch or lantern utilizing an open flame along any excavation or road, or any place where the dislodgement of such torch or lantern might permit the same to roll, or slide on to any brush-covered land, or any land containing flammable material.

SECTION 10.5.6.10 OPEN FLAME DEVICES IN PORTS/WHARVES

- A. No person shall use any open flame device for maintenance or repair on any boat, ship or wharf without a permit from the Philippine Coast Guard and/or the Philippine Port Authority.
- B. No person shall use any portable barbecue, brazier or cooking device on any boat, ship or wharf without a permit from the Philippine Coast Guard and/or the Philippine Port Authority.
- C. Any open flame device used for lighting or decoration on the exterior of any boat, ship or wharf must be approved by the Philippine Coast Guard and/or the Philippine Port Authority.

SECTION 10.5.6.11 VACATING PREMISES

Upon vacating or abandoning any premise, the occupant thereof shall remove any and all noxious and hazardous material or waste matter which has been deposited, allowed to come to rest, or permitted to accumulate thereon, and such premises shall be left in clean and neat condition.

SECTION 10.5.6.12 VACANT BUILDINGS

Every person owning, or in charge or control of, any vacant building shall remove therefrom all accumulation of flammable or combustible waste or rubbish and shall securely lock, barricade, or otherwise secure all doors, windows and other openings thereof.

DIVISION 7. URBAN AND RURAL PRE-FIRE PLANNING

SECTION 10.5.7.1 HYDRANT

- A. Project developers or owners of housing projects shall provide a hydrant system and develop the source of water used for the purpose of providing adequate water supply for fire suppression use on both economic and socialized housing in connection with this Code.
- B. Local Government Units (LGUs) in coordination with the BFP shall provide each community with fire hydrants and cisterns or elevated tanks that will suffice the requirement pertaining to provision of water for fire fighting operation.
- C. All reservoir or water tanks must provide a 20% fire reserve over and above the Average Daily Demand Supply (ADDS).

D. In communities where no public water supply is available, a water well or any other devices with water impounding capability shall be provided.

SECTION 10.5.7.2 FIRE LANE

The BFP is authorized to direct installation of fire lanes, signages or other approved notices for emergency use in coordination with concerned government agencies.

A. Requirements

1. Curb top and side shall be painted red and the words "**FIRE LANE**" shall be stenciled on the top and side of all red curbs at a maximum interval of 50 feet. Letters shall be three inches (3") in height with a minimum 3/4-inch in stroke.
2. Outlining or painting the fire lane area in red with the words "**FIRE LANE**" in white, at intervals of not more than 50 feet or as otherwise directed by the BFP. Size of lettering shall be not less than 24 inches in height and three inches (3") in stroke.

B. Enforcement

The enforcement of fire lanes shall be the responsibility of the BFP in coordination with the LGU and other concerned government agencies.

RULE 11. PROHIBITED ACTS

SECTION 11.0.0.1 PROHIBITED ACTS AND OMISSIONS

The following are declared as prohibited acts and omissions:

- A. Obstructing or blocking the exit ways or across to buildings clearly marked for fire safety purposes, such as but not limited to aisles in interior rooms, any part of stairways, hallways, corridors, vestibules, balconies or bridges leading to a stairway or exit of any kind, or tolerating or allowing said violations;
- B. Constructing gates, entrances and walkways to building components and yards, and temporary or permanent structures on public ways, which obstruct the orderly and easy passage of fire fighting vehicles and equipment;

- C. Prevention, interference or obstruction of any operation of the fire service, or of duly organized and authorized fire brigades;
- D. Obstructing designated fire lanes or access to fire hydrants;
- E. Overcrowding or admission of persons beyond the authorized capacity in movie houses, theaters, coliseums, auditoriums or other public assembly buildings, except in other assembly areas on the ground floor with open sides or open doors sufficient to provide safe exits;
- F. Locking fire exits during period when people are inside the building;
- G. Prevention or obstruction of the automatic closure of fire doors or smoke partitions or dampers;
- H. Use of fire protective of fire fighting equipment of the fire service other than for fire fighting except in other emergencies where their use are justified;
- I. Giving false or malicious fire alarms;
- J. Smoking in prohibited areas as may be determined by fire service, or throwing of cigars, cigarettes, burning objects in places which may start or cause fire;
- K. Abandoning or leaving a building or structure by the occupant or owner without appropriate safety measures;
- L. Removing, destroying, tampering or obliterating any authorized mark, seal, sign or tag posted or required by the fire service for fire safety in any building, structure or processing equipment; and
- M. Use of jumpers or tampering with electrical wiring or overloading the electrical system beyond its designated capacity or such other practices that would tend to undermine the fire safety features of the electrical system.

RULE 12. FIRE CODE TAXES, FEES/CHARGES AND FINES

SECTION 12.0.0.1 SOURCES OF INCOME

Pursuant to Section 12, in relation to Section 13 of RA 9514, the following shall be the sources of income of the BFP:

- A. Fees to be charged for the issuance of certificates, permits and licenses as provided for in Section 7 of RA 9514;
- B. One-tenth of one per centum (0.10%) of the verified estimated value of buildings or structures to be erected, from the owner thereof, but not to exceed fifty thousand (PhP 50,000.00) pesos, at least fifty per centum (50%) to be paid prior to the issuance of the building permit, and the balance, after final inspection and prior to the issuance of the use and occupancy permit;
- C. One-hundredth of one per centum (0.01%) of the assessed value of buildings or structures annually payable upon payment of the real estate tax, except on structures used as single family dwellings;
- D. Two per centum (2%) of all premiums, excluding re-insurance premiums for the sale of fire, earthquake and explosion hazard insurance collected by companies, persons or agents licensed to sell such insurances in the Philippines;
- E. Two per centum (2%) of gross sales of companies, persons or agents selling fire fighting equipment, appliances or devices, including hazard detection and warning systems; and
- F. Two per centum (2%) of the service fees received from fire, earthquake, and explosion hazard reinsurance surveys and post loss service of insurance adjustment companies doing business in the Philippines directly through agents.

SECTION 12.0.0.2 FIRE CODE REVENUES

- A. The classification of Fire Code revenues and rates are prescribed in the following schedule:
 - 1. Fire Code Construction Tax. Tax prescribed in Section 12.0.0.1(B) of this IRR.
 - 2. Fire Code Realty Tax. Tax prescribed in Section 12.0.0.1(C) of this IRR.
 - 3. Fire Code Premium Tax. Tax prescribed in Section 12.0.0.1 (D) of this IRR.
 - 4. Fire Code Sales Tax. Tax prescribed in Section 12.0.0.1 (E) of this IRR.
 - 5. Fire Code Proceeds Tax. Tax prescribed in Section 12.0.0.1 (F) of this IRR.

6. Fire Safety Inspection Fee. Fee charged for the conduct of Fire Safety Inspection equivalent to ten per centum (10%) of all fees charged by the building official, or by the Local Government or by other government agencies concerned in the granting of pertinent permits or licenses.
7. Storage Clearance Fee. Fee derived from storage of flammable and combustible materials.
8. Conveyance Clearance Fee. Fee derived from transporting flammable and combustible materials.
9. Installation Clearance Fee. Fee derived from installation of tanks and pipes of flammable and combustible substances and other fire protection system.
10. Other Clearance Fees. Fees derived from fireworks display, fumigation/fogging, fire drill, hotworks, and other clearances as provided under this IRR.
11. Fire Code Fines – are fees derived from imposition of administrative fines and penalties.

B. The account codes of the above classified taxes, fees/charges and fines shall be prescribed by the Commission on Audit (COA).

SECTION 12.0.0.3 ASSESSMENT

- A. The assessment of fire code taxes, fees/ charges and fines as revenue is vested upon the BFP. The Chief, BFP shall prescribe the procedural rules for such purpose, subject to the approval of the Secretary, DILG.
- B. The City/Municipal Fire Marshal having jurisdiction shall assess the prescribed Fire Code revenues within his area of jurisdiction.
- C. The Chief, BFP or his duly authorized representative shall exercise the general power to assess the prescribed fire code taxes, fees/charges and fines for installations, structures, facilities and operations not within the jurisdiction of any Fire Marshal or in any other conditions as the need thereto arises.
- D. The result of the assessment shall be the basis for issuance of Order of Payment Slip (OPS) by the City/Municipal Fire Marshal having jurisdiction for purposes of collection and deposit.

SECTION 12.0.0.4 SCHEDULE OF FEES AND FINES

A. The following are the schedule of fees.

1. **Storage Clearance Fee** - storage clearance shall be issued upon payment of a fee based on the storage capacity as indicated:

- a. Flammable/combustible solids

- i. Calcium carbide

<u>STORAGE CAPACITY (in kilograms)</u>	<u>ANNUAL FEES (in PhP)</u>
From 40 to 80	14.00
Over 80 to 200	18.00
Over 200 to 2,000	36.00
Over 2,000 to 4,000	54.00
Over 4,000 to 20,000	72.00
Over 20,000 to 40,000	90.00
Over 40,000 to 200,000	135.00
Over 200,000	180.00

- ii. Pyroxylin

<u>STORAGE CAPACITY (in kilograms)</u>	<u>ANNUAL FEES (in PhP)</u>
From 40 to 200	12.00
Over 200 to 800	24.00
Over 800 to 2,000	48.00
Over 2,000 to 4,000	90.00
Over 4,000 to 12,000	180.00
Over 12,000 to 40,000	300.00
Over 40,000	600.00

- iii. Matches

<u>STORAGE CAPACITY (in kilograms)</u>	<u>ANNUAL FEES (in PhP)</u>
From 100 to 400	12.00
Over 400 to 2,000	60.00
Over 2,000 to 4,000	120.00
Over 4,000 to 20,000	240.00
Over 20,000	480.00

- iv. Nitrate, phosphorous, bromine, sodium, picric acid and other hazardous chemicals of similar flammable, explosive, oxidizing or lacrymatory properties:

<u>STORAGE CAPACITY</u> <u>(in kilograms)</u>	<u>ANNUAL FEES</u> <u>(in PhP)</u>
From 20 to 100	12.00
Over 100 to 400	18.00
Over 400 to 2,000	45.00
Over 2,000 to 4,000	90.00
Over 4,000 to 20,000	134.00
Over 20,000	180.00

v. Shredded combustible materials such as wood shaving, excelsior (kusot), sawdust, kapok, straw, hay, combustible loose fibers: cotton waste, (estopa) sisal, oakum and other similar combustible shavings and fine materials:

<u>STORAGE CAPACITY</u> <u>(in cubic meters)</u>	<u>ANNUAL FEES</u> <u>(in PhP)</u>
From 0.25 to 3	12.00
Over 3 to 14	32.00
Over 14 to 28	54.00
Over 28 to 70	90.00
Over 70	139.00

vi. Tar, resin, waxes, copra, rubber, cork, bituminous coal and similar combustible materials:

<u>STORAGE CAPACITY</u> <u>(in kilograms)</u>	<u>ANNUAL FEES</u> <u>(in PhP)</u>
From 200 to 400	14.00
Over 400 to 4,000	28.00
Over 4,000 to 20,000	54.00
Over 20,000	90.00

b. Flammable/Combustible Liquids

i. For flammable liquids having flashpoint of -6.67°C or below. Such as gasoline, ether, carbon bisophide, naptha, benzol (benzene), collodion, afloclin and acetone.

<u>STORAGE CAPACITY</u> <u>(in liters)</u>	<u>ANNUAL FEES</u> <u>(in PhP)</u>
From 20 to 100	10.00
Over 100 to 200	12.00
Over 200 to 400	24.00
Over 400 to 2,000	48.00
Over 2,000 to 4,000	72.00
Over 4,000 to 6,000	100.00
Over 6,000 to 8,000	120.00
Over 8,000 to 10,000	144.00

Over 10,000 to 12,000	192.00
Over 12,000 to 14,000	240.00
Over 14,000 to 16,000	288.00
Over 16,000 to 32,000	360.00
Over 32,000 to 40,000	480.00
Over 40,000 to 200,000	720.00
Over 200,000 to 800,000	1,080.00
Over 800,000 to 2,000,000	1,440.00
Over 2,000,000 to 6,000,000	1,920.00
Over 6,000,000 to 8,000,000	2,400.00
In excess of 8,000,000	2,400 + 1.00/400 liters

ii. For flammable liquids having flashpoint of above -6.67°C and below 22.8°C such as alcohol, amyl, tuluol, ethyl, acetate and like.

<u>STORAGE CAPACITY (in liters)</u>	<u>ANNUAL FEES (in PhP)</u>
From 20 to 100	9.00
Over 100 to 200	12.00
Over 200 to 400	18.00
Over 400 to 2,000	30.00
Over 2,000 to 4,000	48.00
Over 4,000 to 20,000	100.00
Over 20,000 to 100,000	240.00
Over 100,000 to 200,000	480.00
Over 200,000	600.00

iii. For liquids having flashpoint of 22.8°C and below 93.3°C, such as kerosene, turpentine, thinner, prepared paints, varnish, diesel oil, fuel oil, kerosene, cleansing solvent, polishing liquids and similar

<u>STORAGE CAPACITY (in liters)</u>	<u>ANNUAL FEES (in PhP)</u>
From 20 to 100	5.00
Over 100 to 200	8.00
Over 200 to 400	12.00
Over 400 to 4,000	30.00
Over 4,000 to 20,000	90.00
Over 20,000 to 40,000	120.00
Over 40,000 to 200,000	180.00
Over 200,000 to 400,000	300.00
Over 400,000 to 2,000,000	480.00
Over 2,000,000 to 3,600,000	500.00
Over 3,600,000	600.00

iv. For combustible liquids having flash point greater than 93.3°C that is subject to spontaneous ignition or is artificially heated to a temperature equal to or higher than its flash point, such as crude oil, petroleum oil and others.

<u>STORAGE CAPACITY (in liters)</u>	<u>ANNUAL FEES (in PhP)</u>
From 20 to 100	5.00
Over 100 to 200	8.00
Over 200 to 400	12.00
Over 400 to 2,000	24.00
Over 2,000 to 4,000	30.00
Over 4,000 to 80,000	90.00
Over 80,000	180.00

c. Flammable gases

i. Liquefied Petroleum Gas (LPG) in liter water capacity

i.a. For bulk storage:

<u>STORAGE CAPACITY (in liters)</u>	<u>ANNUAL FEES (in PhP)</u>
200 and below	20.00
Over 200 to 2,000	40.00
Over 2,000 to 8,000	80.00
Over 8,000 to 20,000	200.00
Over 20,000 to 200,000	400.00
Over 200,000 to 400,000	1,600.00
For every additional 4,000 liters or fraction thereof in excess of 400,000	10.00

i.b. For other than bulk storage:

<u>STORAGE CAPACITY (in liters)</u>	<u>ANNUAL FEES (in PhP)</u>
60 and below	1.50
Over 60 to 100	2.00
Over 100 to 200	3.00
Over 200 to 400	4.00
Over 400 to 800	8.00
Over 800 to 1,200	12.00
Over 1,200 to 2,000	16.00
For every additional 400 liters water capacity in excess of 2,000	1.00

ii. Other flammable gases in liter water capacity

<u>STORAGE CAPACITY (in liters)</u>	<u>ANNUAL FEES (in PhP)</u>
From 20 to 100	6.00
Over 100 to 400	12.00
Over 400 to 2,000	36.00
Over 2,000 to 8,000	72.00
Over 8,000 to 40,000	180.00
Over 40,000 to 200,000	360.00
Over 200,000 to 400,000	540.00
Over 400,000	900.00

2. **Conveyance Clearance Fee** – Conveyance Clearance shall be **issued** to vehicles transporting any explosives, inflammable liquids and combustible materials over the street of, or through pipelines, or to load or unload such explosives, inflammable liquids or combustible materials in or from any vessel, boat or craft, or railway upon payment of fee based on their capacity as indicated:

a. For every conveyance clearance issued on cargo trucks or motor vehicles with a load capacity not exceeding 2,000 liters of inflammable liquid with a flash point of 93.3°C payable annually PhP 500.00

i. For every additional 400 liters or fraction thereof..... 20.00

b. For every conveyance clearance issued on cargo trucks or motor vehicles with a load capacity of not exceeding 500 kilograms of explosives and/or combustible materials, including hazardous chemicals and gases payable annually..... PhP 300.00

i. For every additional 100 kilos or fraction thereof 20.00

c. For every conveyance clearance issued on tank trucks, tank trailers, and tank semi-trailers carrying inflammable liquids described in sub-paragraph "a" hereof with 2,000 liters capacity tanks which shall be good for period of one (1) year PhP 500.00

i.	For every additional 400 liters capacity or fraction hereof.....	50.00
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d.	For every conveyance clearance issued to cover the transfer of inflammable liquids described in subparagraph a., to shore tanks at terminal, including the discharge of inflammable cargo to bulk lighters undertaken at bay, and its subsequent transportation by water to petroleum wharves, or transfer by bulk lighters from said terminals to vessel at bay:	
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i.	For the first 2,000 liters.....	PhP 200.00
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ii.	For every additional 400 liters or fraction thereof not exceeding 400,000 liters.....	50.00
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iii.	For every additional 4,000 liters or fraction thereof in excess of 400,000 liters.....	20.00
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e.	Provided, that for discharge of flammable liquids with flash points of not less than 65.5°C, clearance fees shall be as follows:	
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i.	For the first 2,000 liters.....	50.00
<hr/>		
ii.	For every additional 400 liters or fraction thereof not exceeding 400,000 liters.....	20.00
<hr/>		
f.	For every additional 4,000 liters or fraction thereof in excess of 400,000 liters.....	20.00
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i.	If the transfer or conveyance of liquids in bulk done by lighters or through pipelines from refineries, the following fees shall be imposed to wit:	
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ii.	For flammable liquids having a flash point of less than 65.5°C for the first 2,000 liters.....	PhP 200.00

iii.	For every additional 4,000 liters or fraction thereof in excess of 2,000 liters	20.00
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g.	For flammable liquids having flash point of 65.5 to 93.3°C	
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i.	For the first 2,000 liters.....	20.00
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ii.	For every additional 4,000 liters or fraction thereof in excess of 2,000 liters	20.00
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h.	For every clearance issued covering the whole operations of loading and unloading to or from a boat, vessel, craft, or railway tanks cars and the transfer of packages of containers of explosives, flammable liquids or combustible materials, including hazardous chemicals and gases at terminals or piers:	
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i.	For the first 2,000 liters or kilograms	PhP 200.00
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ii.	For every additional 400 liters or 100 kilos or fraction thereof not exceeding 40,000 liters or 10,000 kilograms.....	100.00
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iii.	For every additional 4,000 liters or 1,000 kilos or fraction thereof in excess of 40,000 liters or 10,000 kilograms.....	10.00
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3.	Installation Clearance Fee – For installing gas and liquid systems other than at bulk premises, an Installation Clearance shall be issued upon payment of the installer of the amount as prescribed below:	
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a.	Gases (LPG, CNG and other compressed gases) exceeding 454 liters water capacity	PhP 80.00
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	For every additional 100 liters water capacity or fraction thereof in excess of 454 liters	20.00

b. Flammable and combustible liquids in aboveground and underground tanks 300.00

4. **Other Clearance Fee** – Hereunder is the schedule of fees for issuance of a clearance relative to the conduct of the following activities and/or authentication of documents:

- a. Fireworks display PhP 300.00
- b. Fumigation/Fogging 100.00
- c. Fire Drill 200.00
- d. Hotworks 150.00
- e. Fire Incident Clearance 100.00
- f. Certified true copy of Fire Safety Inspection Certificate 100.00
- g. Certified true copy of Building Fire Safety Clearance 100.00
- h. Certified true copy of Fire Clearance 100.00

B. **Administrative Fines** - The following are the schedule of Fire Code Administrative Fines:

1. Failure to provide safety measures for the manufacture, storage, handling, display and/or use of the following hazardous material required in Section 7, paragraph (b) of Republic Act No. 9514.

DESCRIPTION	SCHEDULE OF FINES
a. Cellulose nitrate plastic of any kind	PhP 400.00/kg or less but not exceeding PhP 1,250.00

b.	Combustible fibers	PhP 400.00/m ³ or less but not exceeding PhP 4,000.00
c.	Cellular materials such as foam rubber, sponge rubber and plastic foam	PhP 400.00/m ³ or less but not exceeding PhP 4,000.00
d.	Flammable and combustible liquids or gases of any classification	PhP 400.00/liter or less but not exceeding PhP 12,500.00
e.	Flammable paints, varnishes, stains and organic coatings	PhP 400.00/liter or less but not exceeding PhP 2,500.00
f.	High piled or widely spread combustible stock	PhP 80.00/m ³ or less but not exceeding PhP 12,500.00
g.	Metallic magnesium in any form	PhP 400.00/kilo or less but not exceeding PhP 12,500.00
h.	Corrosive liquids, oxidizing materials, organic peroxide, nitromethane, ammonium nitrate or any amount of highly toxic pyrophoric, hypergolic or cryogenic materials or poisonous gases as well as material compounds which when exposed to heat [of] OR flame become a fire conductor or generate excessive smoke or toxic gases	PhP 400.00 per kilogram/liter or less but not exceeding PhP 12,500.00
i.	Blasting agents, explosives and special industrial explosive materials, blasting caps, black powder, liquid nitro-glycerin, dynamite, nitro-cellulose, fulminates of any kind and plastic explosives containing ammonium salt or chlorate	PhP 2,000.00 per kilogram/liter or less but not exceeding PhP 12,500.00
j.	Liquid Nitroglycerine and liquid Trinitrotoluene	PhP 4,000.00/liter or less but not exceeding PhP 12,500.00

k.	Firework materials of any kind or form	PhP 2,000.00 per kilogram or less but not exceeding PhP 12,500.00
I.	Matches in commercial quantities	PhP 400.00 per matchman gross but not exceeding PhP 12,500.00
m.	Hot ashes, live coals and embers	PhP 200.00/m ³ but not exceeding PhP 4,000.00
n.	Mineral, vegetable or animal oils and other derivative/by-products	PhP 40.00 per liter in excess of twenty five (25) liters but not exceeding PhP 4,000.00
o.	Recycling, reuse and resale of combustible and flammable liquids and other waste materials] combustible waste materials for recycling or resale	PhP 40.00/m ³ but not exceeding PhP 4,000.00
p.	Explosives dusts and vapors	PhP 4,000.00 to PhP 12,500.00 per violation
q.	Agriculture, forest, marine or mineral products which may undergo spontaneous combustion	PhP 400.00/m ³ or less but not exceeding PhP 4,000.00
r.	Any other substance with potential to cause harm to persons, property or environment because of one or more of the following:	Similar nature shall be penalized accordingly
i.	The chemical properties of the substance;	
ii.	The physical properties of the substance;	

iii. The biological properties of the substance. Without limiting the definition of hazardous material, all dangerous goods, combustible liquids and chemicals are hazardous materials.

2. Failure to provide safety measures for the following hazardous operations or processes as required in Section 7, paragraph (c) of the Republic Act No. 9514.

a. Welding or soldering	PhP 400.00 to PhP 4,000.00
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b. Industrial baking and drying	PhP 4,000.00 to PhP 8,000.00
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c. Waste Disposal	PhP 4,000.00 to PhP 8,000.00
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d. Pressurized/forced-draft burning equipment	PhP 4,000.00 to PhP 8,000.00
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e. Smelting and forging	PhP 8,000.00 to PhP 12,500.00
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f. Motion picture projection using electrical arc lamp	PhP 400.00 to PhP 4,000.00
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g. Refining, distillation and solvent extraction	PhP 8,000.00 to PhP 12,500.00

3. Failure to provide the following safety construction protective and warning systems as required in Section 7, paragraph (d) of Republic Act No. 9514.

- a. Fire protection features such as sprinkler alarms hose boxes, hose reels or standpipe alarms and other firefighting equipment PhP 25,000.00 to PhP 37,500.00

- b. Fire alarm systems PhP 25,000.00 to PhP 37,500.00

- c. Fire walls to separate adjoining alarms fee, or alarms fees and storage areas from other occupancies in the same building PhP 25,000.00 to PhP 37,500.00

- d. Provisions for confining the fire at its source such as fire resistive floors and walls extending up to the next floor slab or roof, curtain boards and other fire containing of stopping components PhP 12,500.00 to PhP 25,000.00

- e. Termination of all exits in an area affording safe passage to a public way or safe dispersal area PhP 37,500.00 to PhP 50,000.00

- f. Stairways, vertical shafts, horizontal exits and other means of egress sealed from smoke and heat. PhP 37,500.00 to PhP 50,000.00

- g. A fire exit plan for each floor of the building, showing the routes from each room to appropriate exits, displayed prominently on the door of each room. PhP 12,500.00 to PhP 25,000.00

- h. Self-closing fire resistive doors leading to corridors. PhP 37,500.00 to PhP 50,000.00

- i. Fire dampers in centralized air- conditioning ducts. PhP 37,500.00 to PhP 50,000.00

j.	Roof vents for use of firefighters.	PhP 37,500.00 to PhP 50,000.00
k.	Properly marked and lighted exits with provision for emergency lights to adequately illuminate exit ways in case of power failure.	PhP 12,500.00 to PhP 25,000.00
4. Failure to observe the following declared prohibited acts and omissions as required under Section 8 of Republic Act No. 9514.		
a.	Obstructing or blocking the exit ways or across to buildings clearly marked for fire safety purposes, such as but not limited to aisles in interior rooms, any part of the stairways, corridors, vestibules, balconies or bridges leading to a stairway or exit of any kind or tolerating or allowing said violations.	PhP 12,500.00 to PhP 25,000.00
b.	Constructing gates, entrances and walkways to building components and yards, and temporary or permanent structures on public ways, which obstruct the orderly and easy passage of firefighting vehicles and equipment.	PhP 12,500.00 to PhP 25,000.00
c.	Prevention, interference and obstruction of any operation of the BFP or of duly organized and authorized fire brigades.	PhP 12,500.00 to PhP 25,000.00
d.	Obstructing designated fire lanes or access to fire hydrants.	PhP 12,500.00 to PhP 25,000.00
e.	Overcrowding or admission of alarms beyond the authorized capacity in movie houses, theaters, coliseum, auditorium or other public assembly buildings, except in other assembly areas on the ground floor with open sides or open doors sufficient to provide safe exits.	PhP 25,000.00 to PhP 37,500.00

f. Locking fire exits during period when people are inside the building. PhP 37,500.00 to PhP 50,000.00

g. Prevention or obstruction of the automatic closure of fire doors or smoke partition or dampers. PhP 12,500.00 to PhP 25,000.00

h. Use of fire protective or fire fighting equipment of the BFP other than for fire fighting except in other emergencies where their use are justified. PhP 4,000.00 to PhP 12,500.00

i. Giving false or malicious fire alarms. PhP 4,000.00 to PhP 12,500.00

j. Smoking in prohibited areas as may be determined by the BFP, or throwing of cigars, cigarettes, burning objects in places which may start or cause fire. PhP 4,000.00 to PhP 12,500.00

k. Abandoning or leaving a building or structure by the occupant or owner without appropriate safety measures. PHP 4,000.00 to PHP 20,000.00

l. Removing, destroying, tampering or obliterating any authorized mark, seal, sign or tag posted or required by the BFP for fire safety in any building, structure or processing equipment. PhP 25,000.00 to PhP 37,500.00

m. Use of jumpers or tampering with electrical wiring or overloading the electrical system beyond its designed capacity or such other practices that would tend to undermine the fire safety features of the electrical system. PhP 25,000.00 to PhP 37,500.00

n. Failure to submit copy of fire insurance policy within the prescribed time limit. PhP 4,000.00 to PhP 12,500.00

5. Other violations similar to or of the same nature as any of the above, but not included in this listing, shall likewise be penalized with the same amount.

C. **Indigent Fire Victims** are exempted from paying the Fire Incident Clearance fee upon submission of a certification from the Department of Social Welfare and Development (DSWD).

D. **Public Schools, Local Government Units and other government agencies** are exempted from paying fire drill fee.

E. The foregoing schedule of fees and fines may be changed, altered or amended by the Chief, BFP subject to the approval of the Secretary of the Interior and Local Government.

SECTION 12.0.0.5 MANNER OF COLLECTION

- A. The BFP shall collect the prescribed fire code revenues thru any of the following options:
 1. Direct payment thru Authorized Government Servicing Bank (AGSB) or Authorized Government Depository Bank (AGDB);
 2. Collection by collecting officers; and
 3. Other options that the Chief, BFP may later prescribe, subject to the existing accounting and auditing rules and regulations.
- B. In cases where direct payments using prescribed Special Bank Receipt (SBR) or other options are not yet adopted, all revenue collections shall have corresponding Official Receipt (OR) issued by the BFP. The collections shall be deposited to the AGSB or AGDB unless otherwise later prescribed.
- C. The twenty percent (20%) of all revenues collected set aside and retained for use of the local government concerned and collected by the BFP, shall be remitted to the escrow account of the City/Municipal government concerned.
- D. The eighty percent (80%) of all revenues collected by the BFP shall be remitted to the National Treasury under a trust account prescribed by the Department of Budget and Management (DBM).
- E. All Fire Code taxes, fees, charges and fines collected by the City/Municipal Treasurer upon effectivity of RA 9514 and prior to the effectivity of its IRR shall be remitted to the Bureau of Treasury (BOT) within six (6) months from effectivity of IRR of RA 9514 to the Special Trust Fund Account of the BFP.

SECTION 12.0.0.6 DESIGNATION OF COLLECTING OFFICER

The Chief, BFP or the Regional Director concerned shall designate a Collecting Officer in every City and Municipal BFP office upon recommendation of their respective Fire Marshals.

SECTION 12.0.0.7 UTILIZATION

- A. The twenty percent (20%) set aside and retained for use of the local government concerned, for the purpose as herein prescribed, shall be utilized in accordance with the guidelines as set forth in a Memorandum Circular to be issued by the DILG Secretary.
- B. The eighty percent (80%) of all revenues collected by the BFP shall be used for its modernization as herein prescribed. The Chief, BFP is authorized, subject to the approval of the Secretary of the Interior and Local Government, to use the income generated under the fire code for procurement of fire protection and fire investigation supplies and equipment, rescue, paramedics, supplies and materials, and related technical services necessary for the fire service and the improvement of facilities of the Bureau of Fire Protection and abatement of fire hazards.
- C. The BFP shall prepare progressive modernization plans for its capability building and resource allocation at the national, regional, provincial and city/municipal levels as well as determine among others the optimal number of equipment, including, but not limited to firetrucks and fire hydrants, required by every local government unit for the proper delivery of fire protection services in its jurisdiction.
- D. Standards shall be established and regularly updated to serve as guide in the procurement of the firefighting and investigation supplies and materials, the Bureau of Product Standards (BPS) of the Department of Trade and Industry (DTI) shall evaluate, determine and certify if the supply so procured conforms to the product standards fixed by the BFP. For this purpose, the BFP shall submit to the BPS a detailed set of product standards that must be complied with in the procurement of firefighting and investigation supplies and materials within six (6) months from the effectivity of this Act.

SECTION 12.0.0.8 MONITORING

The Chief, BFP shall, within six (6) months from the effectivity of this IRR, submit to the Secretary of the Interior and Local Government for his/her approval, a management tool mechanism that would ensure effective monitoring of the enforcement of the fire code to include the amount of fire code fees collected.

- A. Every Fire Marshal shall keep a secured permanent recording system for efficient and effective accounting and monitoring of all collected taxes, fire code fees, fines and other charges.
- B. Detailed procedures in assessment, collection, monitoring/reporting shall be embodied in a manual of procedures to be approved by the Secretary, DILG.

SECTION 12.0.0.9 LOCAL TAXES, FEES AND FINES

The collection and assessment of taxes, fees and fines as prescribed in the Local Government Code, except those contained in this Code, shall be the function of the concerned Local Government Units (LGU).

RULE 13. ADMINISTRATIVE COURSES OF ACTION

SECTION 13.0.0.1 GENERAL GUIDELINES

A. Fines

Before a fine is imposed, the violator shall first be informed of his violation/s and ordered to correct the same immediately, if feasible, or within a reasonable period of time as prescribed in Section 13.0.0.6 of this IRR. At the expiration of the period to comply the deficiency/deficiencies, a re-inspection shall be conducted to determine compliance. If compliance was not effected or if compliance does not conform to the required standards, the first violation is committed and the violator shall be fined and further ordered to effect the correction.

Repeated failure on the part of the violator to effect corrections will constitute subsequent violations. Administrative fines shall be imposed for every violation.

B. Abatement

- A. All fire hazards shall be abated immediately. Abatement is any act that would remove or neutralize a fire hazard. Such acts are specified in the Notice to Comply.
- B. Abatement includes, among others, any one or combination or all of the following:
 - a. Removal of the source of ignition;
 - b. Rearranging or adjusting articles within the minimum clearances or dimensions;

- c. Reduction in the amount/quantity of flammable, combustible and/or hazardous materials;
- d. Changes in procedure in the conduct of hazardous operation;
- e. Constructions to limit and control the spread of fire and smoke;
- f. Installation of fire protective and/or warning systems; and
- g. Remodeling, repairing, strengthening, reconstructing, removal and demolition, either partial or total, of the building or structure.
- h. Where there is inaction on the part of the violator, abatement may be made summarily by the BFP if this is the only recourse to remove the imminent danger to life and property and achieve fire safety. In this case, the provisions of Sections 9, 10 and 11 of RA 9514 applies.

C. Stoppage of Operations/Closure

- 1. Stoppage of operation/Closure of the building shall be resorted to by the BFP when the offender fails to comply with the abatement order.
- 2. Recourse to closure and/or stoppage of operations may likewise be resorted to when the deficiency constitutes a clear and imminent danger to life and property such that evacuation of the building or establishment and stoppage of operations therein are extremely necessary.

SECTION 13.0.0.2 FIXING OF FINES

- A. Administrative fines shall be determined as follows:
 - 1. When the violation carries an administrative fine which has a rate per unit volume, weight or unit, the fine shall be computed by multiplying the weight/volume/unit by the rate.
 - 2. Where the violation carries a fine within a certain range (for example, PhP 25,000.00 – PhP 37,500.00), the fine increases with the number of times a violation of the same provision is committed:
 - a. First violation – the fine shall be the minimum amount in the range.
 - b. Second violation – the fine shall be the maximum amount in the range.
 - 3. When two or more offenses are committed, the same procedures in para "A" 1 and 2 above shall be followed, but the fine shall be sum of all administrative fines; Provided, that the total fines shall not exceed fifty thousand pesos (PhP 50,000.00).

B. **Failure to Pay Fine.** – Failure on the part of the violator to pay the administrative fine within the period fixed in the Notice shall constitute a ground for the issuance of an Order for Stoppage of Operation of the building or the portion thereof or stoppage of the hazardous operation in such building.

SECTION 13.0.0.3 JURISDICTION

A. Fines

1. Fines up to thirty thousand pesos (PhP 30,000.00) shall be imposed by the City/Municipal Fire Marshal having jurisdiction.
2. Fines exceeding thirty thousand pesos but not more than forty thousand pesos (PhP 40,000.00) shall be imposed by the Provincial/District Fire Marshal having jurisdiction.
3. Fines exceeding forty thousand pesos up to fifty thousand pesos (PhP 50,000.00) shall be imposed by the Regional Director having jurisdiction.

B. Stoppage of Operation/Closure of Buildings

This penalty shall be imposed by the Regional Director upon the recommendation of the City/Municipal Fire Marshal having jurisdiction thru channel. The implementation of this order may be delegated to the Provincial/District Fire Marshal having jurisdiction.

C. Declaration of Public Nuisance

The declaration of a building, structure or facility as a public nuisance pursuant to Section 9 of RA 9514 shall be made by the Chief, BFP upon the recommendation of the City/Municipal Fire Marshal having jurisdiction thru channel.

D. Abatement

1. Orders for simple abatement such as removal of fire hazardous materials, removal of obstruction to exit ways or means of egress or similar actions that do not entail financial expenditures on the part of violator, shall be issued by the City/Municipal Fire Marshal having jurisdiction concerned.
2. Orders for abatement involving alteration, modification or repair of equipment, machinery, protective systems, buildings, structures, or facilities shall be issued by the Provincial/District Fire Marshal having jurisdiction.

3. Orders for abatement involving condemnation and/or removal of defective machinery, equipment or protective system, or demolition, either partial or total, of buildings, structures or facilities shall be issued by the Regional Director having jurisdiction.
4. Orders for the summary abatement of a building, structure, or facility declared as a public nuisance shall be issued by the Chief, BFP.
5. The expenses incurred by the government for such summary abatement shall be borne by the owner, administrator or occupant. These expenses shall constitute a prior lien upon such property.
6. If the owner, administrator or occupant fails to reimburse the government of the expenses incurred in the summary abatement within ninety (90) days from the completion of such abatement, the building or structure shall be forfeited in favor of the government and sold at public auction in accordance with existing laws and rules. No property subject of lien under Section 9 of RA 9514, may be sold at a price lower than the abatement expenses incurred by the government. The property shall be forfeited in favor of the government if the highest bid is not at least equal to the abatement expenses.

E. The decisions of the foregoing authorities are executory, subject to exception provided in Section 13.0.0.1.

SECTION 13.0.0.4 GENERAL PROCEDURES

- A. When the Inspection Report submitted by the Fire Safety Inspector indicates violation of the Fire Code or its IRR, the City/Municipal Fire Marshal having jurisdiction shall immediately issue notice to comply within which compliance shall be effected within the period provided for under Section 13.0.0.6. Such Notice shall include, among others, a citation of the specific provision/s of the Fire Code and its IRR violated and the specific actions/corrections that should be complied for period of not exceeding fifteen (15) days. The original copy of such Notice shall be served upon the person responsible for the violation within five (5) days from submission of the Report.
- B. After the lapse of the prescribed period to comply, a re-inspection shall be conducted. When the after re-inspection report submitted by the FSI indicates non-compliance of the Notice, the City/Municipal Fire Marshal having jurisdiction shall impose the following:
 1. Put up a sign in front of the building or structure that it is a fire hazard. Specifically, the notice shall bear the words "WARNING: THIS BUILDING/STRUCTURE IS A FIRE HAZARD", which shall remain posted until such time that the owner, administrator, occupant or other persons responsible for the condition of the building, structure and their

premises or facilities correct the same, but such period shall not exceed fifteen (15) days from the lapse of the initial period given in the notice/order to comply;

2. Impose the corresponding administrative fines; and
3. Issue the notice to correct violation. The said notice shall include, among others, a citation of the specific provision/s of the Fire Code and its IRR violated and the specific actions/corrections that should be complied for a period of not exceeding fifteen (15) days.

C. After the lapse of the prescribed period to comply provided for under the notice to correct violations, a re-inspection shall be conducted. When the re-inspection report submitted by the FSI indicates non-compliance of the order contained in the **notice to correct violations**, the City/Municipal Fire Marshal having jurisdiction shall:

1. Effect the continuous posting of the sign in front of the building or structure that it is a fire hazard. Specifically, the notice shall bear the words "WARNING: THIS BUILDING/STRUCTURE IS A FIRE HAZARD", which shall remain posted until such time that the owner, administrator, occupant or other persons responsible for the condition of the building, structure and their premises or facilities correct the same, but such period shall not exceed fifteen (15) days from the lapse of the period given in the **notice to correct violations**;
2. Impose the administrative fine for the violation;
3. Issue **abatement order** to the owner, administrator or occupant of the building, structure and their premises or facilities for a period not exceeding fifteen (15) days.

D. After the lapse of the prescribed period to comply provided for under the abatement order, a re-inspection shall be conducted. When the re-inspection report submitted by the FSI indicates non-compliance of the abatement order, the City/Municipal Fire Marshal having jurisdiction shall:

1. Effect the continuous posting of the sign in front of the building or structure that it is a fire hazard. Specifically, the notice shall bear the words "WARNING: THIS BUILDING/STRUCTURE IS A FIRE HAZARD", which shall remain posted until such time that the owner, administrator, occupant or other persons responsible for the condition of the building, structure and their premises or facilities abate the same.
2. Recommend, through channel, to the Regional Director for the issuance of an order for stoppage of operations and closure order;

E. During re-inspection under para "B" to "D" of this Section, initial compliance was effected by the owner, the said notice to correct violations/abatement order may not be issued. In lieu thereof, the owner

shall execute an affidavit of undertaking specifically thereof among others the period of completion of work. For this purpose, the owner shall attach in his affidavit the contract of works, if any.

- F. An Order to Pay Fine shall be issued immediately without need of issuing a Notice to Comply/Correct Violation for the violations which shall be corrected immediately or within 24 hours as provided in Section 13.0.0.6.

SECTION 13.0.0.5 PUBLIC NUISANCE

Any building or structure assessed and declared by the City/Municipal Fire Marshal having jurisdiction as a fire trap on account of the gravity or palpability of the violation or is causing clear and present imminent danger, in accordance with para "A" of this Section, to adjoining establishments and habitations shall be recommended for declaration as public nuisance to the Chief, BFP.

A. Imminent Danger

1. An establishment shall be declared an imminent danger when a secondary exit is not present;
2. A residential, healthcare and assembly establishment shall be declared imminent danger if at least two (2) of the following violations are committed:
 - a. Insufficient exit width
 - b. Absence of fire-resistive enclosure for main and secondary exit
 - c. Swing of exit door against the flow of travel
 - d. Obstructed/padlocked fire exit
 - e. Absence/defective fire alarm and smoke detection system
 - f. Absence/inadequate automatic battery-operated emergency light or illuminated exit signs
 - g. Absence of standpipe system
 - h. Absence of automatic fire suppression system
3. A business, mercantile and educational establishments shall be declared imminent danger if at least three (3) of the violations cited in Section 13.0.0.5 para "A" (2) (a) through (h) are committed.

B. Procedures

1. A notice of declaration as a public nuisance shall be issued by the Chief, BFP to the owner, administrator, occupant or other person responsible for the condition of the building, structure and their

premises or facilities. The notice shall contain the grounds relied upon in declaring the same as public nuisance.

2. Upon receipt of the notice, the owner, administrator, occupant or other person responsible for the condition of the building, structure and their premises or facilities shall cause the immediate abatement of the hazard therein specified within the following periods:
 - a. If the assessed value of the nuisance or the amount to be spent in abating the same is not more than one hundred thousand pesos (PhP 100,000.00), the owner, administrator or occupant thereof shall abate the hazard within fifteen (15) days from receipt of the order declaring said building or structure a public nuisance; or
 - b. If the assessed value is more than one hundred thousand pesos (PhP 100,000.00), the owner, administrator or occupant thereof shall abate the hazard within thirty (30) days from receipt of the order declaring said building or structure a public nuisance;
3. Failure to comply within five (5) days from the receipt of the notice shall cause the Chief, BFP to put up a sign in front of the building or structure, at or near the entrance of such premises, notifying the public that such building or structure is a "FIRETRAP", which shall remain posted until the owner, administrator, occupant or other person responsible for the condition of the building, structure and their premises or facilities abate the same within the specified period.
4. Failure of the owner, administrator, occupant or other person responsible for the condition of the building, structure and their premises or facilities to abate the same, shall constrain the BFP to employ all corrective measures undertaken to abate hazards which shall include but not limited to remodeling, repairing, strengthening, reconstructing, removal and demolition, either partial or total, of the building or structure.

SECTION 13.0.0.6 PERIOD FOR CORRECTING VIOLATIONS

A. Immediately or within twenty four (24) hours

1. Obstructing or blocking the exit ways or access to building clearly marked for fire safety purposes, such as, but not limited to aisles in interior rooms, any part of stairways, hallways, corridors, vestibules, balconies or bridges leading to a stairway or exit of any kind, or tolerating or allowing said violations;
2. Prevention, interference or obstruction of any operation of the BFP, or of duly organized and authorized fire brigades.
3. Obstructing designated fire lanes or access to fire hydrant.

4. Overcrowding or admission of person beyond the authorized capacity in movie houses, theaters, coliseums, auditorium or other public assembly buildings except in other assembly areas on the ground floor with open sides or open doors sufficient to provide exits;
5. Locking fire exits during periods when people are inside the building;
6. Prevention or obstruction of the automatic closure of fire doors or smoke partitions or dampers;
7. Use of fire protective or fire fighting equipment of the Fire Service other than for fire fighting except in other emergencies where their use are justified.
8. Giving false or malicious fire alarms;
9. Smoking in prohibited areas as may be determined by the Fire Service, or throwing cigars, cigarettes, or burning objects in places which may start or cause fires;
10. Removing, destroying, tampering or obliterating any authorized mark, seal sign, or tag posted or required by the Fire Service for fire safety in any building, structure or processing equipment;
11. Use of jumpers or tampering with electrical wiring or overloading the electrical system beyond its designed capacity or such other practices that tend to undermine the fire safety features of the electrical system;
12. Failure to observe fire safety precaution for the following:
 - a. Hot ashes, live coals and embers;
 - b. Flammable paints, varnishes, stains and organic coatings;
 - c. Flammable and combustible liquids or gases of any classification;
 - d. Metallic magnesium in any form;
 - e. Blasting agents, explosives and special industrial, explosive materials, blasting caps, black powder, dynamic, nitrocellulose, fulminates of any kind, and plastic explosives containing ammonium salt or chlorate;
 - f. Liquid nitroglycerine and liquid trinitrotoluene;
 - g. Firework materials of any kind of form;
 - h. Explosive dusts and vapors;

- i. Welding or soldering;
- j. Industrial/commercial baking and drying;
- k. Smelting and forging; or
- l. Refilling, distillation and solvent extraction of flammable/combustible liquids; and

13. Other violations similar to or of the same nature as any of the above, but not included in this listing, shall likewise be allocated the same period.

B. Within three (3) days

- 1. Constructing gates, entrances and walkways to building components and yards which obstruct the orderly and easy passage of fire fighting vehicles and equipment;
- 2. Abandonment or leaving a building or structure by the occupant or owner without appropriate safety measures;
- 3. Failure to submit copy of fire insurance policy within the prescribed time limit;
- 4. Failure to observe fire safety precaution for the following:
 - a. High piled or widely spread combustible stock;
 - b. Corrosive liquids, oxidizing materials, organic peroxide, nitromethane, ammonium nitrate or any amount of highly toxic pyrophoric, hypergolic or cryogenic materials or poisonous gases as well as materials compounds which when exposed to heat or flame become a fire conductor or generate excessive smoke or toxic gases;
 - c. Matches in commercial quantities (more than 60 watchman's gross);
 - d. Combustible waste materials for recycling or resale;
 - e. Agricultural, forest, marine or mineral products which may undergo spontaneous combustion;
 - f. Waste disposal of combustible materials;
 - g. Pressurized/forced-draft burning equipment; or
 - h. Motion picture projection using electrical lamp; and

5. Other violations similar to or the same nature as any of the above, but not included in this listing, shall likewise be allocated the same period.

C. Within seven (7) days

1. For failure to provide the fire safety precautions for the following:
 - a. Combustible fibers;
 - b. Cellular materials such as foam rubber, sponge rubber and plastic foam;
 - c. Mineral, vegetable or animal oils and other derivative by-products.
2. Other violations similar to or of the same nature as any of the above, but not included in this listing, shall likewise be allocated the same period.

D. Within ten (10) days

1. Failure to provide fire walls to separate adjoining building, or warehouse and storage areas from other occupancies in the same building; and
2. Other violations similar to or of the same nature as any of the above, but not included in this listing, shall likewise be allocated the same period.

E. Within fifteen (15) days

1. Failure to provide, install and maintain the following:
 - a. Fire alarm system;
 - b. Provision for confining the fire at its source such as fire resistive floor slab or roof, curtain boards and other fire containing or stopping components;
 - c. A fire exit plan or diagram for each floor of the building showing the routes from each room to appropriate exits, displayed prominently on the door of each room;
 - d. Properly marked and lighted exits with provisions for emergency lights to adequately exit ways in case of power failure;
2. Failure to develop and implement a fire safety and education programs.
3. Failure to provide on effect the following:

- a. Fire protection features such as sprinkler systems, hose boxes, hose reels or standpipe system and other fire fighting equipment;
- b. Termination of all exits in area affording safe passage to a public way or safe dispersal area;
- c. Stairways, vertical shafts, horizontal exits and other means of egress sealed from smoke and heat;
- d. Self-closing fire resistive door leading to corridors;
- e. Fire dampers in centralized air-conditioning ducts; or
- f. Roof vents for use by fire fighters; and

4. Other violations similar to or of the same nature as any of the above, but not included in this listing, shall likewise be allocated the same period.

SECTION 13.0.0.7 PENALTIES FOR SPECIFIC INDIVIDUALS

A. Against Private Person

1. Administrative Penalties
 - a. The owner, administrator, occupant or other person responsible for the condition of the building, structure and their premises or facilities who violates any provision of the Fire Code or any of its implementing rules and regulations shall be penalized by:
 - i. Administrative fine of not exceeding Fifty thousand pesos (P50,000.00); or
 - ii. Stoppage of operations or by closure of such buildings, structures and their premises or facilities which do not comply with the requirements; or
 - iii. Both such administrative fine and closure/stoppages of operation to be imposed by the proper authorities.

Provided that, payment of the fine, stoppage of operations and/or closure of such buildings, structures, and their premises or facilities shall not absolve the violator from correcting the deficiency or abating the fire hazard.

2. Punitive Penalties

- a. In case of willful failure to correct the deficiency or abate the fire hazard as provided in the preceding subsection, the violator shall, upon conviction, be punished by:

- i. Imprisonment of not less than six (6) months nor more than six (6) years, or
- ii. By a fine of not more than One hundred thousand pesos (P100,000.00) or
- iii. Both such fine and imprisonment

Provided, however, that in the case of a corporation, firm, partnership or association, the fine and/or imprisonment shall be imposed upon its officials responsible for such violation, and in case the guilty party is an alien, in addition to the penalties herein prescribed, he shall immediately be deported: Provided, finally, that where the violation is attended by injury, loss of life and/or damage to property, the violator shall be proceeded against under the applicable provisions of the Revised Penal Code.

- b. Any person who, without authority, maliciously removes the sign that a building or structure is a fire hazard/firetrap placed by the authorized person in this Code shall be liable for imprisonment for thirty (30) days or a fine not exceeding One hundred thousand pesos (P100,000.00) or both in the discretion of the court.
- c. Any person, who disobeys the lawful order of the fire ground commander during a firefighting operation, shall be penalized with imprisonment of one (1) day to thirty (30) days and a fine of Five thousand pesos (P5,000.00).
- 3. In all cases mentioned above, regardless of whether the violation is categorized as administrative or punitive, the City or Municipal Fire shall have the authority to determine whether a criminal charge is going to be instituted and shall initiate the filing thereof.

B. Against Public Officer

1. Administrative

The following acts or omissions shall render the public officer/employee in charge of the enforcement of the Fire Code, its implementing rules and regulation and other pertinent laws, administratively liable and shall be punished by reprimand, suspension or removal at the discretion of the disciplining authority, depending on the gravity of the offense:

- a. Unjustified failure of the public officer/employee to conduct inspection of buildings or structures at least once a year;
- b. Deliberate failure to put up a sign in front of the building or structure within his/her area of responsibility found to be violating this Code,

its implementing rules and regulations and other pertinent laws, that the same is a "FIRE HAZARD" or a "FIRETRAP";

- c. Endorsing to the Chief, BFP or his/her duly authorized representative for the certification, or submitting a report that the building or structure complies with the standards set by this Code, its implementing rules or regulations or other pertinent laws when the same is contrary to fact;
- d. Issuance or renewal of occupancy or business permit without the fire safety inspection certificate issued by the Chief, BFP or his/her duly authorized representative;
- e. Failure to cancel the occupancy or business permit after the owner, administrator, occupant or other person responsible for the condition of the building, structure and other premises failed to comply with the notice/order for compliance with the standards set by this Code, its implementing rules and regulations and other pertinent laws, within the specified period;
- f. Failure to abate a public nuisance within fifteen (15) days after the owner, administrator, occupant or other responsible person failed to abate the same within the period contained in the notice to abate;
- g. Abusing his/her authority in the performance of his/her duty through acts of corruption and other unethical practices; or
- h. Other willful impropriety or gross negligence in the performance of his/her duty as provided in this act or its implementing rules and regulations.

2. Punitive

In case of willful violation involving the abovementioned acts or omissions enumerated under Section 11 subparagraph 2(A), the public official shall, upon conviction, be punished by imprisonment of not less than six (6) months nor more than six (6) years, or by a fine of not more than One hundred thousand pesos (PhP100,000.00) or both such fine and imprisonment: Provided, That where the violation is attended by injury, loss of life and/or property, the violator shall be proceeded against under the applicable provisions of the Revised Penal Code.

RULE 14. MISCELLANEOUS PROVISIONS

SECTION 14.0.0.1 APPEAL

- A. All administrative actions under the Fire Code and its IRR, by an Officer pursuant to Rule 13 of this IRR shall be appealable to the next higher authority within fifteen (15) days from receipt of the pertinent order or notice. For this purpose, next higher authority refers to: District Fire Marshal/Provincial Fire Marshal if the decision was made by the City/Municipal Fire Marshal having jurisdiction; the Regional Director, for the decisions of District Fire Marshal/Provincial Fire Marshal having jurisdiction; the Chief BFP, for the decisions of the Regional Director; and lastly the Secretary, DILG for decisions of the Chief, BFP.
- B. The decisions of the said appellate authorities are final and executory except in cases of stoppage of operation and closure of buildings where appeal may be elevated up to the Secretary, DILG. Decisions of the Secretary, DILG shall be final and executory.

SECTION 14.0.0.2 CITIZEN PARTICIPATION

A. Cooperation with BFP

The Fire Code and its IRR are designed to achieve fire safety in the community. To this end, inspections are to be conducted by elements of the BFP. All inspections of premises shall be done by duly designated and authorized BFP personnel in distinctive uniform, with proper identification cards and mission orders. Citizens can assist in achieving the goals of public fire safety by cooperating with such duly authorized inspectors and affording them the opportunity to accomplish their mission.

B. Individual and Group Initiative

All persons are encouraged to inspect their own premises and to abate any fire hazard therein, as well as take the necessary fire safety precautions. They shall strive to organize themselves into effective fire safety and fire prevention organizations in their community and places of work in order for them to take the necessary contingent actions during fire emergencies and eventually avoid unnecessary loss of life and property.

SECTION 14.0.0.3 IMPLEMENTING DETAILS

The Chief, BFP shall have the authority to issue such further implementing details as may be necessary to carry out the provisions of RA 9514 and these Rules and Regulations, with the approval of the Secretary, DILG.

SECTION 14.0.0.4 DUTIES AND RESPONSIBILITIES OF THE CHIEF, BFP

- A. It is the duty of the Chief, BFP to ensure strict implementation of the Fire Code and its Implementing Rules and Regulations.
- B. However, in cases of existing buildings which when forced to comply will compromise the structural stability/integrity, the Chief, BFP may accept adequate alternative and/or remedial fire safety measures in lieu of the fire safety requirements of this IRR upon application by the owner/occupant/building administrator of the building or structure.
- C. For this purpose, a Technical Committee shall be created to assist the Chief, BFP in determining the adequacy of the said alternative measures.
- D. The basis for the evaluation of the Technical Committee shall be in accordance with an implementing guidelines approved by the Secretary of the Interior and Local Government.

SECTION 14.0.0.5 SEPARABILITY CLAUSE

If any provision of this IRR or the application thereof to any person or circumstances is declared unconstitutional or invalid by a competent court, the other sections and provisions hereof which are not affected thereby shall continue to be in full force.

SECTION 14.0.0.6 REPEALING AND AMENDING CLAUSE

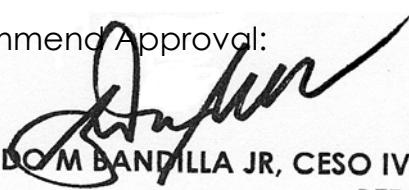
All administrative orders, rules and regulations, memoranda, circulars and other issuances inconsistent herewith or contrary to the provisions of these rules and regulations are hereby repealed and/or modified accordingly.

SECTION 14.0.0.7 EFFECTIVITY

These Implementing Rules and Regulations shall take effect thirty (30) days after publication of the last installment in a newspaper of general circulation.

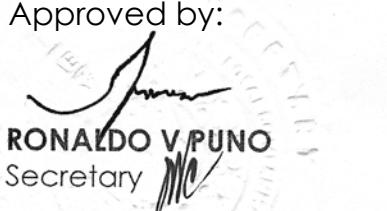
Done in Quezon City, this 24th day of June 2009.

Recommend Approval:


ROLANDO M. BANDILLA JR., CESO IV
CSUPT

Acting Chief, BFP

Approved by:


RONALDO V. PUNO
Secretary 

Date:

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DEPARTMENT OF THE INTERIOR
AND LOCAL GOVERNMENT
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